



I'm not a robot



**Continue**

[Database management essentials 2nd edition mannino pdf download full version](#)



most one row. Requirements can be notoriously difficult to capture. SELECT \* FROM Order, Customer WHERE OrdNo = \$X AND Order.CustNo = Customer. Hierarchical Form Lab 6. • Interviewer data include a unique interviewer identifier, a name, a phone, an e-mail address, and a web address. 11.1.3 PL/SQL Statements Programming Language/Structured Query Language (PL/SQL) is a proprietary database programming language for the Oracle DBMS. Example 11.31: Trigger to Ensure That a Salary Increase Does Not Exceed 10 percent Note that the NEW and OLD keywords should not be preceded by a colon (:) when used in a condition in the WHEN clause. Acquiring the knowledge can be difficult because much of it is specific to each DBMS. How are relationships and cardinalities identified in a problem narrative? In addition to SQL, many DBMSs provide graphical, window-oriented tools. To a large extent, your skill in retrieving useful data will depend on your ability to use the join operator. A staging area may also be used to support the data transformation process. Because the multidimensional representation matches the needs of business analysts, this representation is widely used in business reporting tools even when relational tables provide physical storage. The possible actions are restrict (do not permit the action on the referenced row), cascade (perform the same action on the related rows), nullify (set the foreign key of related rows to null), and default (set the foreign key of related rows to a default value). Web development is dominated by markup languages such as the Hypertext Markup Language (HTML), eXtensible Markup Language (XML), and Cascading Style Sheets (CSS). Why use the OTHERS exception? In Oracle, TRIGGERS can provide a level of support for generalization hierarchies using the PRIMARY KEY (EmpNo) CONSTRAINT PKEYNO PRIMARY KEY (EmpNo). CREATE TABLE Office (OfficeNo INTEGRATE, OFFERNAME VARCHAR(30), CONSTRAINT PKOffice PRIMARY KEY (OFFERNAME), CONSTRAINT PKEYNO UNIQUE (EmpNo)) Figure 6.34: Conversion of the 1-1 Relationship in Figure 6.33 (SQL:2011 Syntax) 6.4.5 Comprehensive Conversion Example This section presents a larger example to integrate your knowledge of the conversion rules. In addition to the examples, Appendix 4.4 summarizes syntax differences among major DBMSs. The examples use the university database tables introduced in Chapter 3. • Some tasks may involve subtasks, changing the notion of atomicity. Use Table 1-4 as a guide. Design an ERD for the Task entity type and an M-N self-referencing relationship. What level of involvement is necessary to utilize recovery and concurrency control services provided by a DBMS? The Oracle 12c optimizer considers dynamic statistics based on the complexity of query conditions, the existing base statistics, and the expected execution time for the SQL statement. Transaction throughput, the number of transactions processed per unit of time, is a measure of the amount of work performed by a DBMS. An equal-height histogram will provide much better estimation for the query. Visio DFD/FIX notation allows a parent entity type to contain a discriminating attribute. Besides the full featured features of CASE tools that specialize in a subset of database development, Microsoft Visio provides considerable advantages. This textbook provides extensive coverage of the Entity-Relationship Model. The player selection window shows the remaining time (Figure 15.16) for player selection to view information where a partially integrated ERD is merged with the next view. MOLAR engines generally offer the best query performance but suffer from limitations in the size of data cubes supported. Customer checks the status of an order. The Data Pipeline Project supports efficient transfer of data from school districts to the education data warehouse. A regular expression (or regex for short) contains literals, metacharacters, and escape characters together that define a search pattern. Capitalize can reduce execution time for complex queries because the time-consuming phases of the translation process are not performed after the initial binding occurs. Redesign the table so that it has only one index per row. Table 4-10: Sample Table OfferNo OFFERNAME 1111 CourseNo IS480 2012 FALL 2222 IS480 2012 FALL 3333 IS20 2012 SPRING Table 4-11: Sample Enrollment Table StdNo OfferNo EmpGrade 111-11-1111 3.1 3.3 111-11-1111 3333 3.3 111-11-1111 5553 3.8 222-222-1111 3.2 222-222-1111 3.3 3.3 1111 3.6 Table 4-12: Example 4.23: Result CourseNo OfferNo AvgGrade QUERY FORMULATION WITH SQL – CHAPTER 4 IS480 2222 3.3 IS480 1111 3.3 The conceptual evaluation process is a sequence of operations as indicated in Figure 4.2. This process is conceptual rather than actual because most DBMSs can produce the same output using many shortcuts. Another reason for favoring the refinement approach is that relationships can be overlooked when using normalization 2N+3 28 CHAPTER 7 – NORMALIZATION OF RELATIONAL TABLES as the initial design approach. 2012 Sam Student 00011 Any State 31 Oct Each application must be developed without relying on standard ACID consistency levels for all replicated data that it may use. Nonclustered indexes? The length of the disruption depends on the type of checkpoint used. A similar transformation is shown for student majors in Figure 6.7b. Statistic recommendations require comparison of stored statistics for a query with statistics obtained from sampling the associated tables. Data names vary by DBMS. Attribute comparison constraints restrict the values of attributes either to a fixed collection of values or to values of other attributes. You can assume that this description is the result of an initial investigation with appropriate personnel at the water utility. Two-Phase Commit Protocol (2PC): a rule to ensure that distributed transactions are atomic. Encapsulation, the hiding of implementation details, supports data independence. PatientTable2-1 (PatNo, PatAge, PatZip) FOREIGN KEY (PatZip) REFERENCES PatientTable2-2 (VisItNo, PatNo, VisitDate) FOREIGN KEY (PatNo) REFERENCES PatientTable2-1 Using 2NF and 3NF requires two normalization steps. These kinds of constraints are easy to test and understand. The attributes specific to commercial customers (TaxPayerID and EnterpriseZone) do not apply to residential customers and vice-versa. The Envir Database Zone (www.THE\_RELATIONAL\_DATA\_MODEL-.CHAPTER 3 Restrict: an operator that retrieves a subset of the rows of the input table that satisfy a given condition. For the third question, you should look for computations involving aggregate functions in the problem statement. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database for managing the task assignments on a work order. The extended cross product (product for short) operator builds a table from two tables consisting of all possible combinations of rows, one from each of the two input tables. This subsection provides details about both kinds of data dictionaries. A student can submit many bids and an interview block can receive many bids. 44. Certainly these fields have the same general meaning. Identify the results (grant or wait) for the following lock requests given the sample lock table below (Table 15P1). • Add shipping address fields to the Invoice entity type. Show the result of a restrict operation that lists the orders in February 2013. To undo (redo) a transaction, the undo (redo) operation is applied to all log records of a specified transaction except for the start and commit records. You should not use generalization hierarchies just because an entity can exist in multiple states or roles. Why is support for development of data intensive Web applications an important motivation for database programming languages? A project operation retrieves a subset of specified columns of the input table. Distributed database design and physical database design involve mostly hard skills. Next you will learn to recognize nested queries and apply them to formulate problems involving the join and difference operators. What is the objective of concurrency control? In addition, some of the features of the independent tools have been incorporated into the enterprise products. When using the registration form to enroll in courses, a record is inserted in the Registration table after completing the main form. • Categories have other attributes not shown in an entity line: a unique category number (name is also unique), a description, a type (asset, expense, revenue, or liability), and a tax-related status (yes or no). The input parameters provide the values to insert. Remove duplicate rows from the result. Hierarchies can be used to drill down from higher levels of detail (e.g., state and city) to roll-up in the reverse direction. Each binary relationship converts to a table as shown in Tables 7.9 and 7.10. See also nested loops and sort merge. • For each customer, the database records the unique customer number, the name, the address, the contact name, the phone, the e-mail address, and the list of events requested by the customer. In each NORMALIZATION OF RELATIONAL TABLES - CHAPTER 7 case, choose appropriate names for the relationships and describe the meaning of the relationships. Guidelines in the methodology indicate that transaction entity types typically have numeric data that can be summarized. A page is dirty if it has been changed by a transaction. References for Further Study For a more detailed description of the database development process, you can consult specialized books on database design such as Batin, Ceri, and Navathe (1992) and Teorey et al. Using Oracle (either 11.2g or 12c), define a security type and a typed security table. What happens to unmatched rows with the join operator? Your solution should include a hierarchical structure for the form, an ERD that represents the form, and design justification. Initially, a new breed of companies developed storage engines, summary data retrieval, and data transformation tools for business intelligence. Parallel Database Management System (DBMS): a DBMS capable of utilizing tightly-coupled computing resources (processors, disks, and memory). Such was the old order of the computer industry when IBM was dominant. Show how node concatenations and key borrowings after deleting the keys. In Figure 16.20, double counting of sales occurs when summarizing sales by individual salesperson and date. Using the Oracle proprietary notation, summarize each supervisor (non-flat row) on the number of subordinates (direct and indirect) and sum of the salary of the subordinates. Correcting and Standardizing Values Correcting values involves resolution of missing and conflicting values. Merging of firms typically triggers a major customer matching effort. Superkey: a column or combination of columns containing unique values for each row. For example, a clustering index on the CourseNo, OFFYear, or OFFTerm columns may be useful if perhaps 20 percent of the rows satisfy the associated condition in the query. CUBE and ROLLUP operations can be included in a GROUPING SETS operation. Applying the notation involves consistent and complete representation of user requirements, generation of alternative designs, and documentation of design decisions. The reversed transformations mostly simplify a data model rather than expand it with more details. For example, a room does not have a separate identity from its building because a room is physically contained in a building. The architectures, known as RAID-X, support parallel processing with varying amounts of performance and reliability. Workload specifications are stored in the Automatic Workload Repository. A product operation to combine the rows. The trigger updates the OffInnumEnrolled column enrolled in the related Offering row. A discriminating attribute contains one value for each subtype in the category. DBAs typically deal with two kinds of data dictionaries to track the database environment. As an ideal, you should try to define tables in which most constraints result from keys and domains. In Figure 16.12, the parent college level drills down to the department child level with a smaller total. To eliminate the redundancy, you should split UnivTable4 into two tables, as shown in Figure 7.4. StdNo S1 S2 S2 OfferNo O1 O2 O3 UnivTable4 Email [email protected] [email protected] [email protected] EnvGrade (StdNo, EnvGrade) FOREIGN KEY (StdNo) REFERENCES UnivTable4-2 UnivTable4-2 (StdNo, Email) Figure 7.4: Sample Rows, Dependency Diagram, and Normalized Tables for UnivTable4 UnivTables (Figure 7.5) depicts another example of a table with multiple, composite candidate keys. For the Auto Dealership ERD shown in Figure 6.15, identify and resolve errors and note incompleteness in the specifications. See also drill-down. What tables are needed? CASE tools are not capable of providing a complete list of FDs, however. The privileges are vendor specific so you need to read the documentation of an enterprise DBMS. Database access is necessary to populate controls in data intensive web pages for shopping cart and other consumer Web applications. Topological Order: an order consistent with relationships in a diagram. Define a 1-M updateable query involving the Customer, the OrderTbl table, and the Employee table. The result of a ROLLUP operation can be produced using a number of SELECT statements connected by the UNION operator as shown in Example 17.8. The additional SELECT statements generate subtotals for each ordered subset of grouped columns. Restrict: an operator of relational algebra. The fact table stores numeric data (facts), such as sales results, while the dimension tables store descriptive data corresponding to individual dimensions of the data cube such as product, location, and time. As a response to the 2007 law, the Colorado Department of Education extended its Education Data Warehouse and developed web portals to support assessments of student growth. The second step of the hybrid methodology involves analysis of existing ERDs. This step may be partially automated although tool development has not been reported. ROLLBACK statements are useful in testing code when database changes should not be permanent. The combination can be considered a relationship or entity type. Distance Measures for String Comparisons: important components of entity matching solutions. Next you will learn about query language extensions for data warehouse retrievals. Product and Shipment are derived from the child node. RateSet CustomerRateSet Assigned CustNo MeterNo I Contains Rate Seto 1 MinUsage 3 Readby RTI Readby includes Readby 4 Revised Water Utility ERD with Annotations Table 6-4: List of Design Justifications for the Revised ERD. 1. • For triggers that fire on UPDATE statements, always list the columns in which the trigger applies. Thus, the essential idea of relationship independence is not to see relationships that can be derived by joining other (independent) relationships. The triangle (index set) represents a normal Btree index; identify any nonpartitionability problems involving the relationships. AFTER INSERT ON Enrollment FOR EACH ROW BEGIN UPDATE Offering SET OffInnumEnrolled + 1 WHERE OfferNo = :NEW.OfferNo; EXCEPTION WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURES AND TRIGGERS CHAPTER 11 – Testing Statements #1 SET PROCEDURE #1 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #2 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #3 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #4 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #5 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #6 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #7 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #8 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #9 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #10 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #11 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #12 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #13 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #14 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #15 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #16 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #17 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #18 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #19 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #20 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #21 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #22 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #23 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #24 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #25 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #26 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #27 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #28 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #29 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #30 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #31 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #32 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #33 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #34 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #35 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #36 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #37 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #38 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #39 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #40 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #41 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #42 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #43 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #44 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #45 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #46 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #47 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #48 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #49 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #50 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #51 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #52 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #53 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #54 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #55 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #56 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #57 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #58 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #59 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #60 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #61 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #62 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #63 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #64 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #65 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #66 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #67 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #68 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #69 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #70 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #71 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #72 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #73 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #74 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #75 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #76 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #77 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #78 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #79 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #80 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #81 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #82 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #83 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #84 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #85 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #86 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #87 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #88 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #89 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #90 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #91 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #92 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #93 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #94 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #95 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #96 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #97 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #98 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #99 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #100 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #101 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #102 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #103 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #104 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #105 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #106 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #107 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #108 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #109 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #110 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #111 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #112 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #113 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #114 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #115 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #116 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #117 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #118 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #119 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #120 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #121 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #122 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #123 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #124 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #125 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #126 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #127 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #128 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #129 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #130 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #131 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #132 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #133 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #134 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #135 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #136 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #137 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #138 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #139 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #140 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #141 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #142 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #143 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #144 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #145 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #146 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #147 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #148 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #149 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #150 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #151 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #152 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #153 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #154 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #155 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #156 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #157 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #158 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #159 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #160 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #161 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #162 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, 'Database error: END'; /SET PROCEDURE #163 WHEN OTHERS THEN RAISE\_APPLICATION\_ERROR(-20001, '









CrsUnits = 3 WHERE CourseNo = 'IS485'; ROLLBACK; Example 11.24: Trigger That Fires for Every DELETE Statement on the Course Table Along with Testing Code to Fire the Trigger CREATE OR REPLACE TRIGGER tr\_Course\_DA AFTER DELETE ON Course FOR EACH ROW BEGIN -- No references to NEW row because only OLD exists for DELETE dbms\_output.put\_line('Deleted Row'); dbms\_output.put\_line('CourseNo: '||OLD.CourseNo); dbms\_output.put\_line('Course Description: '||OLD.CrsDesc); dbms\_output.put\_line('Course Units: '||To\_Char(OLD.CrsUnits)); END; / -- Testing statements SET SERVEROUTPUT ON; -- Insert row so that it can be Described INSERT INTO Course (CourseNo, CrsDesc, CrsUnits) VALUES ('IS485', 'Advanced Database Management', 4); DELETE FROM Course WHERE CourseNo = 'IS485'; ROLLBACK; Example 11.25: Triggered with a Combined Event That Fires for Every action on the Course Table Along with testing Code to Fire the Trigger CREATE OR REPLACE TRIGGER tr\_Course\_DUA AFTER INSERT OR UPDATE OR DELETE ON Course FOR EACH ROW BEGIN dbms\_output.put\_line('Inserted Table'); dbms\_output.put\_line('CourseNo: '||NEW.CourseNo); dbms\_output.put\_line('Course Description: '||NEW.CrsDesc); dbms\_output.put\_line('Course Units: '||To\_Char(NEW.CrsUnits)); END; / -- Testing statements SET SERVEROUTPUT ON; INSERT INTO Course (CourseNo, CrsDesc, CrsUnits) VALUES ('IS485', 'Advanced Database Management', 4); STORED PROCEDURES AND TRIGGERS - CHAPTER 3 UPDATE Course SET CrsUnits = 3 WHERE CourseNo = 'IS485'; ROLLBACK; Triggers, unlike procedures, cannot be tested directly. If there are multiple attributes that do not apply to all entities and there is an accepted classification of entities, a generalization hierarchy may be used. Therefore, this subsection emphasizes the Oracle trigger execution procedure with comparison about the Oracle and the SQL-2011 execution procedures. This example does not produce the same result as Example 19.20 for SQL-2011. In the revised list of tables, PatricTable1 and PatientTable2 contain the violated FDs. PatientTable3 retains the remaining columns. 501 502 CHAPTER 14 - DATA AND DATABASE ADMINISTRATION Database Security: protecting data from unauthorized access and malicious destruction. More detail about column distributions and relational distributions can be added after the system is partially populated. Therefore, you would seek only to understand the meaning of each operator, how they combine operators to write expressions. Using Oracle (either 11.2g or 12c), insert an object into the typed CommonStock table for Dell Corporation common stock. Materialized views are useful for data warehouses as presented in Chapter 6. See also chapter 14 subtype, UNIVERSAL AND RELATIONAL DIAGRAMS - CHAPTER 5 Review Concepts - Basic conceptual entity types, relationships, and associations. M-M and many-to-many relationships are constrained by cardinalities. Cardinality is optional, mandatory, and functional. Existence dependency is based on the stored existence of one entity. Identification dependency involving weak entity types is identifying relationships between entities, not just with one of the entity types. • Equivalence between an M-N relationship and an associative entity type is identifying 1:M relationships. • M-N relationships with attributes: attributes are associated with the cardinality of both types of entities, not just with one of the entity types. • M-way associations: entity types to represent M-W relationships. • Many-to-many relationships with attributes: reasonable values, and data collection completeness. • Diagram rules to prevent obvious data modeling errors. • Common sources of diagram errors: identification dependency and redundant keys. • Support for the diagram rules in data modeling tools through diagram construction and analysis tools • ERD variations: symbols and diagram rules • Modified Crow's Foot notation in the data modeling tools of Aquia Data Studio, Oracle SQL Developer, and Visio 2010 Professional Edition • Class Diagram notation of the Unified Modeling Language as an alternative to the Entity Relationship Model Questions 1. As the number of dimensions increase, business analysts find a multidimensional representation easier to understand and visualize as compared to a relational representation. 7 Note that the ON UPDATE and RESTRICT keywords are not valid syntax in Oracle. This transformation can be useful to record a finer level of detail about an entity. In DKNF, domain refers to a data type, a set of values with allowable operations. Chapter 10 applies your skills to building applications with views, while Chapter 11 applies your skills to stored procedures and triggers. In Figure 15-14, a member can choose only an unreserved (white) time slot. Determining data to load in a warehouse involves matching business intelligence needs to the realities of available data. A data administrator primarily has planning and policy setting roles, while a database administrator has a more technical role focused on individual databases and DBMSs. A data administrator also views data resources in a broader context and considers all kinds of data, both traditional business data and non-traditional unstructured data such as images, videos, and social media. For example, to maintain a history of employee titles, the EmpTitle attribute is replaced with an entity type and a 1-M relationship. • A Guide to Data Governance for Privacy, Confidentiality, and Compliance (Part 3): Managing Technological Risk, Microsoft Corporation, Whitepaper, March 2010. If two variables are independent, it is redundant to store data about how they are related. In Access, this problem is especially difficult to formulate as a single SELECT statement. Instead NoSQL database products use simplified database models, less stringent transaction processing models, and distributed processing to reduce bottlenecks for dealing with big data. Instead, lenders typically contract with a service provider and guarantor. Both the security type and table have no parent. Business changes are posted to the database without excessive delays. Partially Integrated ERD View n Incremental view integration Integrated ERD (Views 1 to n) Figure 12.20: Incremental Integration Process Incremental Integration Approach: a view and partially integrated ERD are merged in each integration step. For example, Table 16-5 contains 20 nonempty cells corresponding to 20 rows in Table 16-4. 247 248 CHAPTER 7 - NORMALIZATION OF RELATIONAL TABLES 33 Likewise, if Faculty.FacNo is updated, then set FacNo to its default value in related Offering rows. Normalization: the process of removing redundancies from tables so that the tables are easier to change. Nonprocedural Database Language: a language such as SQL that allows you to specify the parts of a database to access rather than to code a complex procedure. A similar trigger is necessary to direct graduate student updates to the Student2 or GradStudent2 table. With two values in the StoreZip column and three values in the TimeMonth column, the number of subtotal combinations is six (two StoreZip subtotals, three TimeMonth subtotals, and one grand total) as shown in Example 17.2. Blank values in the result represent a summary over all possible values of the column. Poor produced quality can lead to loss of sales, lawsuits, and customer dissatisfaction. After the conversion, write down FDs for each table. A primary key can take any value as long as it does not match the primary key value in an existing row. In Example 4.35, the Enrollment table is needed even though it does not supply columns in the result or conditions to test. DBMSs provide an important part of the computing infrastructure. DELETE Offering ' FROM OFFERING INNER JOIN FACULTY ON OFFERING.FacNo = Faculty.FacNo WHERE Faculty.FacFirstName = 'LEONARD' AND Faculty.FacLastName = 'VINCE' Example 9.11a: UPDATE Statement Using a Type I Nested Query Update the location of offerings taught by Leonard Fabin in 2013 to BLM412. Integration involves recognizing and resolving conflicts. One record is shown in the main form and multiple, related records are shown in the subform. The systems analysis phase produces an initial version of these models. • However, the relationship between students and textbooks (StdNo-TexNo) can be derived by the other two relationships. Note that the result of Student1 DIFFERENCE Student2 would not be the same as Student2 DIFFERENCE Student1. Message-Oriented Middleware: maintain a queue of messages. Second, most tables in 3NF (even ones with multiple composite, candidate keys) are also in BCNF. In addition, most of the products in Table 2-2 have several different versions that vary in price and features. 15.2.1 Objective of Concurrency Control The objective of concurrency control is to maximize transaction throughput while preventing interference among multiple users. Triggers are part of SQL-2011. Authorization rules DBA Authentication, access requests Database security system Users Data dictionary Figure 14.5: Database Security System The most common approach to authorization rules is known as discretionary access control. In queries 9 and 10, although the individual conditions on OTermAnd OFYear are not highly selective, the combined condition may be reasonably selective to recommend bitmap indexes, especially in query 9 with the additional condition on CourseNo. There is an index on StdCapa because parameter values should be very high or low, providing high selectivity with few rows in the result. 56. The Crow's Foot symbol (two angled lines and one straight line) denotes many (zero or more) related entities. The database administrator should review access plans of poorly performing queries and update. The includes relationship between the Bill and the Reading entity types is subtle. Because of the investment level and the market power of the relational DBMS vendors, most data warehouses now use relational DBMSs, at least in part. Oracle 12c provides hybrid histograms, a variation of equal-height histograms to improve row count estimates involving popular values. Each column value using CHAR contains the maximum number of characters (L) even if the actual length is shorter. A booking involves a vehicle brought to an auto shop by a customer. You can reverse the transformations as shown in Table 6-3 although the reversed transformations are less frequently used. 137 138 CHAPTER 5 - UNDERSTANDING ENTITY RELATIONSHIP DIAGRAMS Self-Referencing Relationship: a relationship involving the same entity type. What is the third step of specifying data requirements for hierarchical forms? Why is management of the log critical to recovery? Reservations can be made six days in advance beginning at 7AM. The supply-driven methodology seems amenable to automation although automated tools to support the methodology have not been reported. Statement-level interfaces are available for standard and proprietary languages. 122-44-8752 Joe Bishop ... Each task on a work order has a status (not started, in progress, or completed), actual hours, and a completion date. An owner can possess one or more homes. In addition, projects are provided about Oracle advanced features, benchmark development, and management practices to develop or manage a significant database or data warehouse in an organization. If a database is used predominantly for queries, avoiding modification anomalies may not be an appropriate design goal. If the customer on an order is the same as the customer on the related invoice, a relationship is not needed. An index can improve performance on retrievals but reduce performance on updates. Then the relationship between students and textbooks is no longer independent of the other two relationships. The trigger contains a WHEN clause to restrict the trigger execution. Typically, event plans are made for the setup, the operation, and the cleanup of an event. In Oracle, the nested query would be a view (see Chapter 10 for an explanation of views). Because of this independence, the Enrollment table and the related associative entity type Enrollment have redundancy. The serializable level prevents all concurrency control problems but involves the most overhead and waiting. Each detail line contains a line number, a transaction date, a merchant name, and the amount of the transaction. Metacharacter: a character with special meaning in a regular expression. For the following description of an airline reservation database, identify functional dependencies and construct normalized tables. A histogram is a two-dimensional graph in which the x-axis represents column ranges and the y-axis represents the number of rows. Even with these formalizations, aids you to work many problems to learn query formulation and the SELECT statement. DATA AND DATABASE ADMINISTRATION - CHAPTER 14.23. The transaction designer can code statements to explicitly delete the tentative parts of a transaction, but this coding can be tedious and involve excessive overhead. See also parametric user and power user. In these organizations, functional users may participate in designing and implementing databases. 15.4.5 Relaxed Transaction Consistency Model Some high performance applications in ecommerce can tolerate eventual consistency to increase availability. These technologies can be deployed in cloud computing environments that provide economies of scale, elimination of fixed infrastructure costs, and dynamic scalability. Some additional parts of PL/SQL (ursors and exceptions) are shown to demonstrate the utility of stored procedures. Student Loan Limited currently uses a legacy system with older file technology. Initially you are presented with relatively simple examples so that you become comfortable with the basics of the SQL SELECT statement. A client process can place a message on a queue and a server can remove a message from a queue. 225 226 CHAPTER 7 - NORMALIZATION OF RELATIONAL TABLES 5 You can remember this definition by its analogy to the traditional justice oath: "Do you swear to tell the truth, the whole truth, and nothing but the truth, ...". The DBMS converts an application's request to a request using the conceptual schema rather than the view. Partial integralization is applied to the ERDs resulting from integrating the view subsets. The ALREADY keyword indicates that the value is always automatically generated. A nonclustering index can also be used in a join if one table in the join has a small number of rows in the result. For each consistency error in Figure 5.22, identify the consistency rule violated and suggest possible resolutions of the error. Why is it difficult to know when a logical record access result in a physical record access? The most recent value is the net quantity of the asset times the most recent value. This chapter describes properties of transactions, SQL statements to define transactions, and properties of transaction processing. For example, age > 21 is an important value-based constraint in a database used to restrict sales of alcohol to minors. Notice that only one row of the cross product is deleted. SQL-2011: the most recent standard of the Structured Query Language. • Limit data manipulation statements in AFTER triggers to statements that are likely to succeed. The traditional cycle must be modified for several constraints. • Referential integrity rule: Only two kinds of values can be stored in a foreign key - a value matching the primary key in some table containing the associated candidate key or a null value. Therefore, the developer must be aware of what it fails to succeed. • UNION operator: If it fails to succeed, then the UNION operator will not work as expected. Updatable UNIONs are more restrictive than Microsoft Access 1-M updatable queries on the supported modifications operations. For example, even though many users may try to reserve a popular flight using a reservation transaction, the DBMS ensures that users do not overwrite each other's work. 14.1 ORGANIZATIONAL CONTEXT for Managing Databases This section reviews management decision-making levels and discusses database support for decision making at all levels. CREATE TABLE Faculty (FacNo CHAR(11), FacName VARCHAR(30), ... CONSTRAINT PKFaculty PRIMARY KEY (OfferNo) ) CREATE TABLE Offering (OfferNo INTEGER, OfLocation VARCHAR(30), OfTime TIMESTAMP, ... CONSTRAINT PKOffering PRIMARY KEY (OfferNo) ) CREATE TABLE Teaches (OfferNo INTEGER, FacultyName VARCHAR(30), ... CONSTRAINT PKTeaches PRIMARY KEY (OfferNo) ) REFERENCES Faculty, CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo) REFERENCES Offerings, Figure 6.26: Conversion of Figure 6.25 (SQL 2011 Syntax) Agent.AgentID, AgentName.HomeNo, HomeNo.Address Commission Figure 6.27: Optional 1-M Relationship with an Attribute Rule 5 is controversial. • The selectivity (fraction of rows) estimate of the condition, HighestDegree = 'HS Graduate', is 0.30. Some typical errors by novice data modelers are due to confusion between the models, devex.com has practical advice about database development and data modeling. A database procedure is like a programming language procedure except that it is managed by the DBMS, not the programming environment. Faigin (1981) describes domain key normal form, the ultimate normal form. What are the responsibilities of data administrators for managing data warehouses? 49. • Guarantor\_Name: name of the guaranteeing financial institution • Note\_Value: amount (in dollars) borrowed by the student applicant; note value is equal to the sum of the disbursement amounts and the fees (origination and guarantee). Why is external software needed when large objects are stored in a database? Full Outer Join: an outer join that produces the matching rows of the join part as well as the non-matching rows from both tables. In the process of revising an ERD, you should carefully document inconsistency and incompleteness in a specification. • The parentheses () denote themselves. What is the difference between a primary key and a candidate key? It surveys database characteristics, database management system features, system architectures, and human roles in managing and using databases. 1.6 Calculate the number of physical records for a static hash file. Transform the ERD in Figure 6.12 by adding unimplied history for the WorksAt 1-M relationship. Proactive approaches can be more cost effective if changes in data collection procedures can be made in different parts of an organization. Because tables are pedious to construct manually, most DBMSs provide tools to construct them automatically. The sample data are repeated in Table 7-P4 for your reference. What does it mean to say that Btrees have logarithmic search cost? With a more complex database, the differences would be even more pronounced with many more views, a much larger conceptual schema, and a more complex internal schema. Updating the primary key of the referenced row in the parent table is updated? Colorado SchoolViewTM is a public portal that uses the Education Data Warehouse. View design and integration helps manage the complexity of such large database design efforts. For most systems, the boundary between phases is blurred and there is considerable backtracking between phases. • The environment knowledge is specific to each DBMS. The methodology has three steps: identify data marts, build the data mart / dimensions matrix, and design fact tables. • An interview includes a unique interview identifier, a date, a time, a location (building and room), an interviewer, and a student. 5.5.4 Entity Relationship Stencil in Visio Professional Since Section 2.4.5 provided an overview of Visio Professional, this section will provide details about the Entity Relationship stencil (collection of shapes) available in the Visio 2010 Professional Edition. 513 514 CHAPTER 14 - DATA AND DATABASE ADMINISTRATION - CHAPTER 14.23. The transaction designer can code statements to explicitly delete the tentative parts of a transaction, but this coding can be tedious and involve excessive overhead. See also parametric user and power user. In these organizations, functional users may participate in designing and implementing databases. 15.4.5 Relaxed Transaction Consistency Model Some high performance applications in ecommerce can tolerate eventual consistency to increase availability. These technologies can be deployed in cloud computing environments that provide economies of scale, elimination of fixed infrastructure costs, and dynamic scalability. Some additional parts of PL/SQL (ursors and exceptions) are shown to demonstrate the utility of stored procedures. Student Loan Limited currently uses a legacy system with older file technology. Initially you are presented with relatively simple examples so that you become comfortable with the basics of the SQL SELECT statement. A client process can place a message on a queue and a server can remove a message from a queue. 225 226 CHAPTER 7 - NORMALIZATION OF RELATIONAL TABLES 5 You can remember this definition by its analogy to the traditional justice oath: "Do you swear to tell the truth, the whole truth, and nothing but the truth, ...". The DBMS converts an application's request to a request using the conceptual schema rather than the view. Partial integralization is applied to the ERDs resulting from integrating the view subsets. The ALREADY keyword indicates that the value is always automatically generated. A nonclustering index can also be used in a join if one table in the join has a small number of rows in the result. For each consistency error in Figure 5.22, identify the consistency rule violated and suggest possible resolutions of the error. Why is it difficult to know when a logical record access result in a physical record access? The most recent value is the net quantity of the asset times the most recent value. This chapter describes properties of transactions, SQL statements to define transactions, and properties of transaction processing. For example, age > 21 is an important value-based constraint in a database used to restrict sales of alcohol to minors. Notice that only one row of the cross product is deleted. SQL-2011: the most recent standard of the Structured Query Language. • Limit data manipulation statements in AFTER triggers to statements that are likely to succeed. The traditional cycle must be modified for several constraints. • Referential integrity rule: Only two kinds of values can be stored in a foreign key - a value matching the primary key in some table containing the associated candidate key or a null value. Therefore, the developer must be aware of what it fails to succeed. • UNION operator: If it fails to succeed, then the UNION operator will not work as expected. Updatable UNIONs are more restrictive than Microsoft Access 1-M updatable queries on the supported modifications operations. For example, even though many users may try to reserve a popular flight using a reservation transaction, the DBMS ensures that users do not overwrite each other's work. 14.1 ORGANIZATIONAL CONTEXT for Managing Databases This section reviews management decision-making levels and discusses database support for decision making at all levels. CREATE TABLE Faculty (FacNo CHAR(11), FacName VARCHAR(30), ... CONSTRAINT PKFaculty PRIMARY KEY (OfferNo) ) CREATE TABLE Offering (OfferNo INTEGER, OfLocation VARCHAR(30), OfTime TIMESTAMP, ... CONSTRAINT PKOffering PRIMARY KEY (OfferNo) ) CREATE TABLE Teaches (OfferNo INTEGER, FacultyName VARCHAR(30), ... CONSTRAINT PKTeaches PRIMARY KEY (OfferNo) ) REFERENCES Faculty, CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo) REFERENCES Offerings, Figure 6.26: Conversion of Figure 6.25 (SQL 2011 Syntax) Agent.AgentID, AgentName.HomeNo, HomeNo.Address Commission Figure 6.27: Optional 1-M Relationship with an Attribute Rule 5 is controversial. • The selectivity (fraction of rows) estimate of the condition, HighestDegree = 'HS Graduate', is 0.30. Some typical errors by novice data modelers are due to confusion between the models, devex.com has practical advice about database development and data modeling. A database procedure is like a programming language procedure except that it is managed by the DBMS, not the programming environment. Faigin (1981) describes domain key normal form, the ultimate normal form. What are the responsibilities of data administrators for managing data warehouses? 49. • Guarantor\_Name: name of the guaranteeing financial institution • Note\_Value: amount (in dollars) borrowed by the student applicant; note value is equal to the sum of the disbursement amounts and the fees (origination and guarantee). Why is external software needed when large objects are stored in a database? Full Outer Join: an outer join that produces the matching rows of the join part as well as the non-matching rows from both tables. In the process of revising an ERD, you should carefully document inconsistency and incompleteness in a specification. • The parentheses () denote themselves. What is the difference between a primary key and a candidate key? It surveys database characteristics, database management system features, system architectures, and human roles in managing and using databases. 1.6 Calculate the number of physical records for a static hash file. Transform the ERD in Figure 6.12 by adding unimplied history for the WorksAt 1-M relationship. Proactive approaches can be more cost effective if changes in data collection procedures can be made in different parts of an organization. Because tables are pedious to construct manually, most DBMSs provide tools to construct them automatically. The sample data are repeated in Table 7-P4 for your reference. What does it mean to say that Btrees have logarithmic search cost? With a more complex database, the differences would be even more pronounced with many more views, a much larger conceptual schema, and a more complex internal schema. Updating the primary key of the referenced row in the parent table is updated? Colorado SchoolViewTM is a public portal that uses the Education Data Warehouse. View design and integration helps manage the complexity of such large database design efforts. For most systems, the boundary between phases is blurred and there is considerable backtracking between phases. • The environment knowledge is specific to each DBMS. The methodology has three steps: identify data marts, build the data mart / dimensions matrix, and design fact tables. • An interview includes a unique interview identifier, a date, a time, a location (building and room), an interviewer, and a student. 5.5.4 Entity Relationship Stencil in Visio Professional Since Section 2.4.5 provided an overview of Visio Professional, this section will provide details about the Entity Relationship stencil (collection of shapes) available in the Visio 2010 Professional Edition. 513 514 CHAPTER 14 - DATA AND DATABASE ADMINISTRATION - CHAPTER 14.23. The transaction designer can code statements to explicitly delete the tentative parts of a transaction, but this coding can be tedious and involve excessive overhead. See also parametric user and power user. In these organizations, functional users may participate in designing and implementing databases. 15.4.5 Relaxed Transaction Consistency Model Some high performance applications in ecommerce can tolerate eventual consistency to increase availability. These technologies can be deployed in cloud computing environments that provide economies of scale, elimination of fixed infrastructure costs, and dynamic scalability. Some additional parts of PL/SQL (ursors and exceptions) are shown to demonstrate the utility of stored procedures. Student Loan Limited currently uses a legacy system with older file technology. Initially you are presented with relatively simple examples so that you become comfortable with the basics of the SQL SELECT statement. A client process can place a message on a queue and a server can remove a message from a queue. 225 226 CHAPTER 7 - NORMALIZATION OF RELATIONAL TABLES 5 You can remember this definition by its analogy to the traditional justice oath: "Do you swear to tell the truth, the whole truth, and nothing but the truth, ...". The DBMS converts an application's request to a request using the conceptual schema rather than the view. Partial integralization is applied to the ERDs resulting from integrating the view subsets. The ALREADY keyword indicates that the value is always automatically generated. A nonclustering index can also be used in a join if one table in the join has a small number of rows in the result. For each consistency error in Figure 5.22, identify the consistency rule violated and suggest possible resolutions of the error. Why is it difficult to know when a logical record access result in a physical record access? The most recent value is the net quantity of the asset times the most recent value. This chapter describes properties of transactions, SQL statements to define transactions, and properties of transaction processing. For example, age > 21 is an important value-based constraint in a database used to restrict sales of alcohol to minors. Notice that only one row of the cross product is deleted. SQL-2011: the most recent standard of the Structured Query Language. • Limit data manipulation statements in AFTER triggers to statements that are likely to succeed. The traditional cycle must be modified for several constraints. • Referential integrity rule: Only two kinds of values can be stored in a foreign key - a value matching the primary key in some table containing the associated candidate key or a null value. Therefore, the developer must be aware of what it fails to succeed. • UNION operator: If it fails to succeed, then the UNION operator will not work as expected. Updatable UNIONs are more restrictive than Microsoft Access 1-M updatable queries on the supported modifications operations. For example, even though many users may try to reserve a popular flight using a reservation transaction, the DBMS ensures that users do not overwrite each other's work. 14.1 ORGANIZATIONAL CONTEXT for Managing Databases This section reviews management decision-making levels and discusses database support for decision making at all levels. CREATE TABLE Faculty (FacNo CHAR(11), FacName VARCHAR(30), ... CONSTRAINT PKFaculty PRIMARY KEY (OfferNo) ) CREATE TABLE Offering (OfferNo INTEGER, OfLocation VARCHAR(30), OfTime TIMESTAMP, ... CONSTRAINT PKOffering PRIMARY KEY (OfferNo) ) CREATE TABLE Teaches (OfferNo INTEGER, FacultyName VARCHAR(30), ... CONSTRAINT PKTeaches PRIMARY KEY (OfferNo) ) REFERENCES Faculty, CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo) REFERENCES Offerings, Figure 6.26: Conversion of Figure 6.25 (SQL 2011 Syntax) Agent.AgentID, AgentName.HomeNo, HomeNo.Address Commission Figure 6.27: Optional 1-M Relationship with an Attribute Rule 5 is controversial. • The selectivity (fraction of rows) estimate of the condition, HighestDegree = 'HS Graduate', is 0.30. Some typical errors by novice data modelers are due to confusion between the models, devex.com has practical advice about database development and data modeling. A database procedure is like a programming language procedure except that it is managed by the DBMS, not the programming environment. Faigin (1981) describes domain key normal form, the ultimate normal form. What are the responsibilities of data administrators for managing data warehouses? 49. • Guarantor\_Name: name of the guaranteeing financial institution • Note\_Value: amount (in dollars) borrowed by the student applicant; note value is equal to the sum of the disbursement amounts and the fees (origination and guarantee). Why is external software needed when large objects are stored in a database? Full Outer Join: an outer join that produces the matching rows of the join part as well as the non-matching rows from both tables. In the process of revising an ERD, you should carefully document inconsistency and incompleteness in a specification. • The parentheses () denote themselves. What is the difference between a primary key and a candidate key? It surveys database characteristics, database management system features, system architectures, and human roles in managing and using databases. 1.6 Calculate the number of physical records for a static hash file. Transform the ERD in Figure 6.12 by adding unimplied history for the WorksAt 1-M relationship. Proactive approaches can be more cost effective if changes in data collection procedures can be made in different parts of an organization. Because tables are pedious to construct manually, most DBMSs provide tools to construct them automatically. The sample data are repeated in Table 7-P4 for your reference. What does it mean to say that Btrees have logarithmic search cost? With a more complex database, the differences would be even more pronounced with many more views, a much larger conceptual schema, and a more complex internal schema. Updating the primary key of the referenced row in the parent table is updated? Colorado SchoolViewTM is a public portal that uses the Education Data Warehouse. View design and integration helps manage the complexity of such large database design efforts. For most systems, the boundary between phases is blurred and there is considerable backtracking between phases. • The environment knowledge is specific to each DBMS. The methodology has three steps: identify data marts, build the data mart / dimensions matrix, and design fact tables. • An interview includes a unique interview identifier, a date, a time, a location (building and room), an interviewer, and a student. 5.5.4 Entity Relationship Stencil in Visio Professional Since Section 2.4.5 provided an overview of Visio Professional, this section will provide details about the Entity Relationship stencil (collection of shapes) available in the Visio 2010 Professional Edition. 513 514 CHAPTER 14 - DATA AND DATABASE ADMINISTRATION - CHAPTER 14.23. The transaction designer can code statements to explicitly delete the tentative parts of a transaction, but this coding can be tedious and involve excessive overhead. See also parametric user and power user. In these organizations, functional users may participate in designing and implementing databases. 15.4.5 Relaxed Transaction Consistency Model Some high performance applications in ecommerce can tolerate eventual consistency to increase availability. These technologies can be deployed in cloud computing environments that provide economies of scale, elimination of fixed infrastructure costs, and dynamic scalability. Some additional parts of PL/SQL (ursors and exceptions) are shown to demonstrate the utility of stored procedures. Student Loan Limited currently uses a legacy system with older file technology. Initially you are presented with relatively simple examples so that you become comfortable with the basics of the SQL SELECT statement. A client process can place a message on a queue and a server can remove a message from a queue. 225 226 CHAPTER 7 - NORMALIZATION OF RELATIONAL TABLES 5 You can remember this definition by its analogy to the traditional justice oath: "Do you swear to tell the truth, the whole truth, and nothing but the truth, ...". The DBMS converts an application's request to a request using the conceptual schema rather than the view. Partial integralization is applied to the ERDs resulting from integrating the view subsets. The ALREADY keyword indicates that the value is always automatically generated. A nonclustering index can also be used in a join if one table in the join has a small number of rows in the result. For each consistency error in Figure 5.22, identify the consistency rule violated and suggest possible resolutions of the error. Why is it difficult to know when a logical record access result in a physical record access? The most recent value is the net quantity of the asset times the most recent value. This chapter describes properties of transactions, SQL statements to define transactions, and properties of transaction processing. For example, age > 21 is an important value-based constraint in a database used to restrict sales of alcohol to minors. Notice that only one row of the cross product is deleted. SQL-2011: the most recent standard of the Structured Query Language. • Limit data manipulation statements in AFTER triggers to statements that are likely to succeed. The traditional cycle must be modified for several constraints. • Referential integrity rule: Only two kinds of values can be stored in a foreign key - a value matching the primary key in some table containing the associated candidate key or a null value. Therefore, the developer must be aware of what it fails to succeed. • UNION operator: If it fails to succeed, then the UNION operator will not work as expected. Updatable UNIONs are more restrictive than Microsoft Access 1-M updatable queries on the supported modifications operations. For example, even though many users may try to reserve a popular flight using a reservation transaction, the DBMS ensures that users do not overwrite each other's work. 14.1 ORGANIZATIONAL CONTEXT for Managing Databases This section reviews management decision-making levels and discusses database support for decision making at all levels. CREATE TABLE Faculty (FacNo CHAR(11), FacName VARCHAR(30), ... CONSTRAINT PKFaculty PRIMARY KEY (OfferNo) ) CREATE TABLE Offering (OfferNo INTEGER, OfLocation VARCHAR(30), OfTime TIMESTAMP, ... CONSTRAINT PKOffering PRIMARY KEY (OfferNo) ) CREATE TABLE Teaches (OfferNo INTEGER, FacultyName VARCHAR(30), ... CONSTRAINT PKTeaches PRIMARY KEY (OfferNo) ) REFERENCES Faculty, CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo) REFERENCES Offerings, Figure 6.26: Conversion of Figure 6.25 (SQL 2011 Syntax) Agent.AgentID, AgentName.HomeNo, HomeNo.Address Commission Figure 6.27: Optional 1-M Relationship with an Attribute Rule 5 is controversial. • The selectivity (fraction of rows) estimate of the condition, HighestDegree = 'HS Graduate', is 0.

entity type. The START TRANSACTION1 and COMMIT statements define the statements in a transaction. What are the two uses of the GRANT statement? What is discretionary access control? Snowflake Schema: a data modeling representation for multidimensional databases. Deletions are handled by removing the deleted key from a node and repairing the structure if needed, as demonstrated in Figure 8.15. Example 17.3: GROUP BY Clause with Three Grouping Columns and the Partial Result without Subtotals SELECT StoreZip, TimeYear, TimeMonth, SUM(SalesDollar) AS SumSales FROM Sales, Store, TimeDim WHERE Sales.StoreId = Store.StoreId AND Sales.TimeYear = TimeDim.TimeYear AND (StoreNation = 'USA' OR StoreNation = 'Canada') AND TimeYear BETWEEN 2012 AND 2013 GROUP BY StoreZip, TimeYear, TimeMonth; 629 630 CHAPTER 17 - DATA INTEGRATION PRACTICES / RELATIONAL DBMS EXTENSIONS StoreZip 80111 2012 TimeMonth 10000 80111 2012 2 12000 80111 2012 3 11000 80111 2013 1 11000 80111 2013 2 13000 80112 2013 1 13000 80112 2013 3 16000 80112 2013 1 16000 80112 2013 4 17000 80112 2013 5 18000 80112 2013 6 19000 80112 2013 7 20000 80112 2013 8 21000 80112 2013 9 22000 80112 2013 10 23000 80112 2013 11 24000 80112 2013 12 25000 80112 2013 13 26000 80112 2013 14 27000 80112 2013 15 28000 80112 2013 16 29000 80112 2013 17 30000 80112 2013 18 31000 80112 2013 19 32000 80112 2013 20 33000 80112 2013 21 34000 80112 2013 22 35000 80112 2013 23 36000 80112 2013 24 37000 80112 2013 25 38000 80112 2013 26 39000 80112 2013 27 40000 80112 2013 28 41000 80112 2013 29 42000 80112 2013 30 43000 80112 2013 31 44000 80112 2013 32 45000 80112 2013 33 46000 80112 2013 34 47000 80112 2013 35 48000 80112 2013 36 49000 80112 2013 37 50000 80112 2013 38 51000 80112 2013 39 52000 80112 2013 40 53000 80112 2013 41 54000 80112 2013 42 55000 80112 2013 43 56000 80112 2013 44 57000 80112 2013 45 58000 80112 2013 46 59000 80112 2013 47 60000 80112 2013 48 61000 80112 2013 49 62000 80112 2013 50 63000 80112 2013 51 64000 80112 2013 52 65000 80112 2013 53 66000 80112 2013 54 67000 80112 2013 55 68000 80112 2013 56 69000 80112 2013 57 70000 80112 2013 58 71000 80112 2013 59 72000 80112 2013 60 73000 80112 2013 61 74000 80112 2013 62 75000 80112 2013 63 76000 80112 2013 64 77000 80112 2013 65 78000 80112 2013 66 79000 80112 2013 67 80000 80112 2013 68 81000 80112 2013 69 82000 80112 2013 70 83000 80112 2013 71 84000 80112 2013 72 85000 80112 2013 73 86000 80112 2013 74 87000 80112 2013 75 88000 80112 2013 76 89000 80112 2013 77 90000 80112 2013 78 91000 80112 2013 79 92000 80112 2013 80 93000 80112 2013 81 94000 80112 2013 82 95000 80112 2013 83 96000 80112 2013 84 97000 80112 2013 85 98000 80112 2013 86 99000 80112 2013 87 100000 80112 2013 88 101000 80112 2013 89 102000 80112 2013 90 103000 80112 2013 91 104000 80112 2013 92 105000 80112 2013 93 106000 80112 2013 94 107000 80112 2013 95 108000 80112 2013 96 109000 80112 2013 97 110000 80112 2013 98 111000 80112 2013 99 112000 80112 2013 100 113000 80112 2013 101 114000 80112 2013 102 115000 80112 2013 103 116000 80112 2013 104 117000 80112 2013 105 118000 80112 2013 106 119000 80112 2013 107 120000 80112 2013 108 121000 80112 2013 109 122000 80112 2013 110 123000 80112 2013 111 124000 80112 2013 112 125000 80112 2013 113 126000 80112 2013 114 127000 80112 2013 115 128000 80112 2013 116 129000 80112 2013 117 130000 80112 2013 118 131000 80112 2013 119 132000 80112 2013 120 133000 80112 2013 121 134000 80112 2013 122 135000 80112 2013 123 136000 80112 2013 124 137000 80112 2013 125 138000 80112 2013 126 139000 80112 2013 127 140000 80112 2013 128 141000 80112 2013 129 142000 80112 2013 130 143000 80112 2013 131 144000 80112 2013 132 145000 80112 2013 133 146000 80112 2013 134 147000 80112 2013 135 148000 80112 2013 136 149000 80112 2013 137 150000 80112 2013 138 151000 80112 2013 139 152000 80112 2013 140 153000 80112 2013 141 154000 80112 2013 142 155000 80112 2013 143 156000 80112 2013 144 157000 80112 2013 145 158000 80112 2013 146 159000 80112 2013 147 160000 80112 2013 148 161000 80112 2013 149 162000 80112 2013 150 163000 80112 2013 151 164000 80112 2013 152 165000 80112 2013 153 166000 80112 2013 154 167000 80112 2013 155 168000 80112 2013 156 169000 80112 2013 157 170000 80112 2013 158 171000 80112 2013 159 172000 80112 2013 160 173000 80112 2013 161 174000 80112 2013 162 175000 80112 2013 163 176000 80112 2013 164 177000 80112 2013 165 178000 80112 2013 166 179000 80112 2013 167 180000 80112 2013 168 181000 80112 2013 169 182000 80112 2013 170 183000 80112 2013 171 184000 80112 2013 172 185000 80112 2013 173 186000 80112 2013 174 187000 80112 2013 175 188000 80112 2013 176 189000 80112 2013 177 190000 80112 2013 178 191000 80112 2013 179 192000 80112 2013 180 193000 80112 2013 181 194000 80112 2013 182 195000 80112 2013 183 196000 80112 2013 184 197000 80112 2013 185 198000 80112 2013 186 199000 80112 2013 187 200000 80112 2013 188 201000 80112 2013 189 202000 80112 2013 190 203000 80112 2013 191 204000 80112 2013 192 205000 80112 2013 193 206000 80112 2013 194 207000 80112 2013 195 208000 80112 2013 196 209000 80112 2013 197 210000 80112 2013 198 211000 80112 2013 199 212000 80112 2013 200 213000 80112 2013 201 214000 80112 2013 202 215000 80112 2013 203 216000 80112 2013 204 217000 80112 2013 205 218000 80112 2013 206 219000 80112 2013 207 220000 80112 2013 208 221000 80112 2013 209 222000 80112 2013 210 223000 80112 2013 211 224000 80112 2013 212 225000 80112 2013 213 226000 80112 2013 214 227000 80112 2013 215 228000 80112 2013 216 229000 80112 2013 217 230000 80112 2013 218 231000 80112 2013 219 232000 80112 2013 220 233000 80112 2013 221 234000 80112 2013 222 235000 80112 2013 223 236000 80112 2013 224 237000 80112 2013 225 238000 80112 2013 226 239000 80112 2013 227 240000 80112 2013 228 241000 80112 2013 229 242000 80112 2013 230 243000 80112 2013 231 244000 80112 2013 232 245000 80112 2013 233 246000 80112 2013 234 247000 80112 2013 235 248000 80112 2013 236 249000 80112 2013 237 250000 80112 2013 238 251000 80112 2013 239 252000 80112 2013 240 253000 80112 2013 241 254000 80112 2013 242 255000 80112 2013 243 256000 80112 2013 244 257000 80112 2013 245 258000 80112 2013 246 259000 80112 2013 247 260000 80112 2013 248 261000 80112 2013 249 262000 80112 2013 250 263000 80112 2013 251 264000 80112 2013 252 265000 80112 2013 253 266000 80112 2013 254 267000 80112 2013 255 268000 80112 2013 256 269000 80112 2013 257 270000 80112 2013 258 271000 80112 2013 259 272000 80112 2013 260 273000 80112 2013 261 274000 80112 2013 262 275000 80112 2013 263 276000 80112 2013 264 277000 80112 2013 265 278000 80112 2013 266 279000 80112 2013 267 280000 80112 2013 268 281000 80112 2013 269 282000 80112 2013 270 283000 80112 2013 271 284000 80112 2013 272 285000 80112 2013 273 286000 80112 2013 274 287000 80112 2013 275 288000 80112 2013 276 289000 80112 2013 277 290000 80112 2013 278 291000 80112 2013 279 292000 80112 2013 280 293000 80112 2013 281 294000 80112 2013 282 295000 80112 2013 283 296000 80112 2013 284 297000 80112 2013 285 298000 80112 2013 286 299000 80112 2013 287 300000 80112 2013 288 301000 80112 2013 289 302000 80112 2013 290 303000 80112 2013 291 304000 80112 2013 292 305000 80112 2013 293 306000 80112 2013 294 307000 80112 2013 295 308000 80112 2013 296 309000 80112 2013 297 310000 80112 2013 298 311000 80112 2013 299 312000 80112 2013 300 313000 80112 2013 301 314000 80112 2013 302 315000 80112 2013 303 316000 80112 2013 304 317000 80112 2013 305 318000 80112 2013 306 319000 80112 2013 307 320000 80112 2013 308 321000 80112 2013 309 322000 80112 2013 310 323000 80112 2013 311 324000 80112 2013 312 325000 80112 2013 313 326000 80112 2013 314 327000 80112 2013 315 328000 80112 2013 316 329000 80112 2013 317 330000 80112 2013 318 331000 80112 2013 319 332000 80112 2013 320 333000 80112 2013 321 334000 80112 2013 322 335000 80112 2013 323 336000 80112 2013 324 337000 80112 2013 325 338000 80112 2013 326 339000 80112 2013 327 340000 80112 2013 328 341000 80112 2013 329 342000 80112 2013 330 343000 80112 2013 331 344000 80112 2013 332 345000 80112 2013 333 346000 80112 2013 334 347000 80112 2013 335 348000 80112 2013 336 349000 80112 2013 337 350000 80112 2013 338 351000 80112 2013 339 352000 80112 2013 340 353000 80112 2013 341 354000 80112 2013 342 355000 80112 2013 343 356000 80112 2013 344 357000 80112 2013 345 358000 80112 2013 346 359000 80112 2013 347 360000 80112 2013 348 361000

binary system measure. Finding an efficient implementation is an optimization problem with an objective and constraints. In addition, you may need several sample instances of a form. aRank := fn\_DetermineRank('789-01-2345', 5679); If aRank > 0 THEN 407 408 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS dbms\_output.put\_line('Rank '|| toChar(aRank)); ELSE dbms\_output.put\_line('Student is not enrolled.'); END IF; -- This call should return a rank of 0. For access plans, a DBA should understand that manual recompilation may be necessary if optimizer statistics become outdated. For the Item entity type, add attributes ItemNo (primary key), ItemDesc, ItemPrice, and ItemType.

Eliminate extraneous columns from the LHS of FDS. 2. To make the calculations easier, fields for annual principal and interest could be added to the Loan entity type. You might want to reread this chapter after completing the chapters in Parts 3 and 4. Relational database diagrams show only maximum cardinalities. Self-joins are useful for finding relationships among keys of the same table. Three-Tier Architecture: a client-server architecture with three layers: a PC client, a backend database server, and either a middleware or an application server. Only two kinds of values can be stored in a foreign key: (1) a value matching a candidate key value in some row of the table containing the associated candidate key or (2) a null value. A security has fields for the unique symbol, the security name, and a time series of closing prices. To help you visualize these differences, Figure 5.7 shows a relational database diagram for the Course-Offering example. Because PL/SQL is a widely used language among Oracle developers and Oracle is a widely used enterprise DBMS, this chapter uses PL/SQL to store procedures and triggers. A phone order has a associated employee. In Chapter 4, you formulated joins using the cross product style of the join operator. Tearing: a feature of Storage Area Networks (SAN) to support the logical names ordered by customer number C095432? Query language compilers recognize the join conditions in the WHERE clause so cross product operations are not necessarily performed. In other systems, you use a particular symbol for a null value. Some DBMSs rebuild automatically after query changes on the database (the structures, table profiles, data types, etc.). Figure 7.P3: ERD for Problem 23 4. The UML supports different kinds of classes to integrate programming language concerns with data model concerns. The catalog name alone is an abbreviation. Novice data modelers violated consistency rule 9 (redesign foreign key rule) because of confusion between an ERD and the relational data model. To become proficient with SQL in particular, ERD, you will need to stick to the well-known functions and rules of a relational database. In other words, think logically, think relationally. The AFTER trigger can be used because it only needs to point to an existing table if the referential constraint is part of the ER model, particularly the enforcement of the Entity-Relationship Model and the Relational Model. As an example, the table (StdNo, OfferNo, CustName, TrdType) is NOT NULL AND TrdType BETWEEN 1-Oct-2013 AND '31-Oct-2013' 10. Stronger operator than join, but less frequently used. Thus, assertions can be used for constraints involving multiple tables and statistical calculations, as demonstrated in Examples 14.6 through 14.8. However, complex assertions should be used sparingly because they can be inefficient to enforce. In Figure 3.5, the result table contains only three columns because the natural join removes one of the FaNo columns. Each sequence of classification and component entity types joined by 1-M relationships in the same direction, becomes a dimension hierarchy. This chapter presented two kinds of data dictionaries: catalog tables used by CASE tools. Nonvolatile: New data in a data warehouse are appended, rather than replaced, so that historical data are preserved. In Figure 14.1(a) known as the shared disk (SD) architecture, each processor has its own memory but the shared disk stores all data. The processors share the disks. Figure 8.16 shows the two parts of a B-tree. Microsoft Access allows either single or double quotes for string constants. In Oracle, the function to char(OrdDate, 'MON') extracts the three-digit month abbreviation from OrdDate. CASE is an acronym for computer-aided software engineering. A true non match involves a prediction of non match and actual non match resulting in two separate records remaining separate. Large organizations now conduct thousands of transactions per minute. Kimball (1996, 2003) provides more details about historical integrity covered in Section 16.3.4. Chapter 17 Data Integration Practices and Relational DBMS Extensions for Data Warehouses Learning Objectives This chapter extends the foundation for data warehouses provided in Chapter 16 with details about data integration and relational DBMS extensions. No Faculty columns are needed in the main query or in the nested query on Offering. Example 4.24 demonstrates grouping applied to a join between Course and Offering. The diagram rules do not ensure that you have considered multiple alternatives, correctly represented your design. Normally, the DBMS and the application have separate memory areas known as buffers. Prototyping tools can be used to create forms and reports that use a database. An Oracle database consists of a collection of tablespaces. SELECT \* FROM Course WHERE CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides the Prepare() procedure to reuse the access plan. In contrast, the number of result columns is the sum of the columns of the two input tables. The logical database design phase consists of two refinement activities: conversion and normalization. Variations to the Star Schema The star schema in Figure 16.9 represents only a single business process for sales tracking. Applying the Simple synthesis Procedure To understand this procedure, you can apply it to the FDs of the university database table repeated in Table 7-7 for ease of reference. For example, SQL%RowCount denotes the number of rows in an implicit cursor. 1.5 Calculate the average number of physical record accesses to find a key that does not exist in an unorderd sequential file and an ordered sequential file. When pressed, Professor Bayer only said that the B represents the B example. Use the LIKE operator along with the pattern-matching character \* to perform prefix matching? CREATE and DROP ROLE Statements CREATE ROLE RoleName [ WITH ADMIN USERNAME ] CURRENT\_ROLE [ | CASCADE ] RESTRICT ] ; GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for privileges REVOKE [ GRANT OPTION FOR ] \* ON ObjectName FROM UserName [ WITH GRANT OPTION ] ; SELECT [ (ColumnName)\* ] DELETED [ ] INSERT [ (ColumnName)\* ] UPDATE [ (ColumnName)\* ] JUSAGE [ ] TRIGGER [ UNDER ] EXECUTE [ ] ; -- GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for roles REVOKE [ GRANT OPTION FOR ] RoleName FROM UserName [ GRANTED BY [ CURRENT\_USER | CURRENT\_ROLE ] ] ; CASCADE ] RESTRICT ] ; DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE DOMAIN AND DROP DOMAIN Statements CREATE DOMAIN DomainName DataType [ CHECK ] ; -- initially defined in Chapter 4 and extended in Chapter 9 DROP ASSERTION AssertionName [ CASCADE ] RESTRICT ] CHECK Constraint Clause in the CREATE TABLE Statement CREATE TABLE TableName [ \* ] : ColumnName DataType [ DEFAULT DefaultValue | USER | NULL | ] [ + ] -- Check constraint can be used as an embedded column -- constraint or as a table constraint. Even with the continued growth of commercial Web commerce, batch processing will remain an important method of processing database work. Similarly for an employee who does not match any customers, the columns pertaining to the Customer table will be blank. The effect of applying the undo operator multiple times is the same as applying undo one time. In the distributed database design and physical database design phases, analysis functions can suggest decisions about data location and index selection. The SQL Tuning Advisor makes recommendations about inadequate statistics, index usage, and coding practices. 52. What is a key column? M-N Relationships with Attributes As briefly mentioned in Section 5.1, relationships can have attributes. Cloud deployment can be public (open to any organization), community (open to cooperating organizations), or hybrid (combination of a public or community cloud and private cloud). Business requirements are rarely well structured. In a fuzzy checkpoint, the recovery manager only writes the buffer pages since the previous checkpoint. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database to assist physical plant personnel in managing assignments of keys to employees. The unique LetterNo field has been added as a convenient identifier of a disclosure letter. You need to identify the matching columns for each join. Appendix 15. A SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the constraint timing clause, the SET CONSTRAINTS statement, the SET TRANSACTION statement, and the save point statements discussed in the chapter. Thus, an offering should not be inserted without a related course. In the parallel approach, such conflicts are not detected until the final step. Person PerNo NamePerCity PerZip Student PerNo FK CourseNo Registers HasCrsDesc CrsUnits PerNo (FK) FacSalary FcRank FacHireDate FaCPerNo (FK) SuperVises Teaches Offering Enrollment OfferNo (FK) FcOffer Grade OfferNo GrpOffer OffLocation OffTime CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides the Prepare() procedure to reuse the access plan. In contrast, the number of result columns is the sum of the columns of the two input tables. The logical database design phase consists of two refinement activities: conversion and normalization. Variations to the Star Schema The star schema in Figure 16.9 represents only a single business process for sales tracking. Applying the Simple synthesis Procedure To understand this procedure, you can apply it to the FDs of the university database table repeated in Table 7-7 for ease of reference. For example, SQL%RowCount denotes the number of rows in an implicit cursor. 1.5 Calculate the average number of physical record accesses to find a key that does not exist in an unorderd sequential file and an ordered sequential file. When pressed, Professor Bayer only said that the B represents the B example. Use the LIKE operator along with the pattern-matching character \* to perform prefix matching? CREATE and DROP ROLE Statements CREATE ROLE RoleName [ WITH ADMIN USERNAME ] CURRENT\_ROLE [ | CASCADE ] RESTRICT ] ; GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for privileges REVOKE [ GRANT OPTION FOR ] \* ON ObjectName FROM UserName [ WITH GRANT OPTION ] ; SELECT [ (ColumnName)\* ] DELETED [ ] INSERT [ (ColumnName)\* ] UPDATE [ (ColumnName)\* ] JUSAGE [ ] TRIGGER [ UNDER ] EXECUTE [ ] ; -- GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for roles REVOKE [ GRANT OPTION FOR ] RoleName FROM UserName [ GRANTED BY [ CURRENT\_USER | CURRENT\_ROLE ] ] ; CASCADE ] RESTRICT ] ; DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE DOMAIN AND DROP DOMAIN Statements CREATE DOMAIN DomainName DataType [ CHECK ] ; -- initially defined in Chapter 4 and extended in Chapter 9 DROP ASSERTION AssertionName [ CASCADE ] RESTRICT ] CHECK Constraint Clause in the CREATE TABLE Statement CREATE TABLE TableName [ \* ] : ColumnName DataType [ DEFAULT DefaultValue | USER | NULL | ] [ + ] -- Check constraint can be used as an embedded column -- constraint or as a table constraint. Even with the continued growth of commercial Web commerce, batch processing will remain an important method of processing database work. Similarly for an employee who does not match any customers, the columns pertaining to the Customer table will be blank. The effect of applying the undo operator multiple times is the same as applying undo one time. In the distributed database design and physical database design phases, analysis functions can suggest decisions about data location and index selection. The SQL Tuning Advisor makes recommendations about inadequate statistics, index usage, and coding practices. 52. What is a key column? M-N Relationships with Attributes As briefly mentioned in Section 5.1, relationships can have attributes. Cloud deployment can be public (open to any organization), community (open to cooperating organizations), or hybrid (combination of a public or community cloud and private cloud). Business requirements are rarely well structured. In a fuzzy checkpoint, the recovery manager only writes the buffer pages since the previous checkpoint. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database to assist physical plant personnel in managing assignments of keys to employees. The unique LetterNo field has been added as a convenient identifier of a disclosure letter. You need to identify the matching columns for each join. Appendix 15. A SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the constraint timing clause, the SET CONSTRAINTS statement, the SET TRANSACTION statement, and the save point statements discussed in the chapter. Thus, an offering should not be inserted without a related course. In the parallel approach, such conflicts are not detected until the final step. Person PerNo NamePerCity PerZip Student PerNo FK CourseNo Registers HasCrsDesc CrsUnits PerNo (FK) FacSalary FcRank FacHireDate FaCPerNo (FK) SuperVises Teaches Offering Enrollment OfferNo (FK) FcOffer Grade OfferNo GrpOffer OffLocation OffTime CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides the Prepare() procedure to reuse the access plan. In contrast, the number of result columns is the sum of the columns of the two input tables. The logical database design phase consists of two refinement activities: conversion and normalization. Variations to the Star Schema The star schema in Figure 16.9 represents only a single business process for sales tracking. Applying the Simple synthesis Procedure To understand this procedure, you can apply it to the FDs of the university database table repeated in Table 7-7 for ease of reference. For example, SQL%RowCount denotes the number of rows in an implicit cursor. 1.5 Calculate the average number of physical record accesses to find a key that does not exist in an unorderd sequential file and an ordered sequential file. When pressed, Professor Bayer only said that the B represents the B example. Use the LIKE operator along with the pattern-matching character \* to perform prefix matching? CREATE and DROP ROLE Statements CREATE ROLE RoleName [ WITH ADMIN USERNAME ] CURRENT\_ROLE [ | CASCADE ] RESTRICT ] ; GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for privileges REVOKE [ GRANT OPTION FOR ] \* ON ObjectName FROM UserName [ WITH GRANT OPTION ] ; SELECT [ (ColumnName)\* ] DELETED [ ] INSERT [ (ColumnName)\* ] UPDATE [ (ColumnName)\* ] JUSAGE [ ] TRIGGER [ UNDER ] EXECUTE [ ] ; -- GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for roles REVOKE [ GRANT OPTION FOR ] RoleName FROM UserName [ GRANTED BY [ CURRENT\_USER | CURRENT\_ROLE ] ] ; CASCADE ] RESTRICT ] ; DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE DOMAIN AND DROP DOMAIN Statements CREATE DOMAIN DomainName DataType [ CHECK ] ; -- initially defined in Chapter 4 and extended in Chapter 9 DROP ASSERTION AssertionName [ CASCADE ] RESTRICT ] CHECK Constraint Clause in the CREATE TABLE Statement CREATE TABLE TableName [ \* ] : ColumnName DataType [ DEFAULT DefaultValue | USER | NULL | ] [ + ] -- Check constraint can be used as an embedded column -- constraint or as a table constraint. Even with the continued growth of commercial Web commerce, batch processing will remain an important method of processing database work. Similarly for an employee who does not match any customers, the columns pertaining to the Customer table will be blank. The effect of applying the undo operator multiple times is the same as applying undo one time. In the distributed database design and physical database design phases, analysis functions can suggest decisions about data location and index selection. The SQL Tuning Advisor makes recommendations about inadequate statistics, index usage, and coding practices. 52. What is a key column? M-N Relationships with Attributes As briefly mentioned in Section 5.1, relationships can have attributes. Cloud deployment can be public (open to any organization), community (open to cooperating organizations), or hybrid (combination of a public or community cloud and private cloud). Business requirements are rarely well structured. In a fuzzy checkpoint, the recovery manager only writes the buffer pages since the previous checkpoint. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database to assist physical plant personnel in managing assignments of keys to employees. The unique LetterNo field has been added as a convenient identifier of a disclosure letter. You need to identify the matching columns for each join. Appendix 15. A SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the constraint timing clause, the SET CONSTRAINTS statement, the SET TRANSACTION statement, and the save point statements discussed in the chapter. Thus, an offering should not be inserted without a related course. In the parallel approach, such conflicts are not detected until the final step. Person PerNo NamePerCity PerZip Student PerNo FK CourseNo Registers HasCrsDesc CrsUnits PerNo (FK) FacSalary FcRank FacHireDate FaCPerNo (FK) SuperVises Teaches Offering Enrollment OfferNo (FK) FcOffer Grade OfferNo GrpOffer OffLocation OffTime CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides the Prepare() procedure to reuse the access plan. In contrast, the number of result columns is the sum of the columns of the two input tables. The logical database design phase consists of two refinement activities: conversion and normalization. Variations to the Star Schema The star schema in Figure 16.9 represents only a single business process for sales tracking. Applying the Simple synthesis Procedure To understand this procedure, you can apply it to the FDs of the university database table repeated in Table 7-7 for ease of reference. For example, SQL%RowCount denotes the number of rows in an implicit cursor. 1.5 Calculate the average number of physical record accesses to find a key that does not exist in an unorderd sequential file and an ordered sequential file. When pressed, Professor Bayer only said that the B represents the B example. Use the LIKE operator along with the pattern-matching character \* to perform prefix matching? CREATE and DROP ROLE Statements CREATE ROLE RoleName [ WITH ADMIN USERNAME ] CURRENT\_ROLE [ | CASCADE ] RESTRICT ] ; GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for privileges REVOKE [ GRANT OPTION FOR ] \* ON ObjectName FROM UserName [ WITH GRANT OPTION ] ; SELECT [ (ColumnName)\* ] DELETED [ ] INSERT [ (ColumnName)\* ] UPDATE [ (ColumnName)\* ] JUSAGE [ ] TRIGGER [ UNDER ] EXECUTE [ ] ; -- GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for roles REVOKE [ GRANT OPTION FOR ] RoleName FROM UserName [ GRANTED BY [ CURRENT\_USER | CURRENT\_ROLE ] ] ; CASCADE ] RESTRICT ] ; DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE DOMAIN AND DROP DOMAIN Statements CREATE DOMAIN DomainName DataType [ CHECK ] ; -- initially defined in Chapter 4 and extended in Chapter 9 DROP ASSERTION AssertionName [ CASCADE ] RESTRICT ] CHECK Constraint Clause in the CREATE TABLE Statement CREATE TABLE TableName [ \* ] : ColumnName DataType [ DEFAULT DefaultValue | USER | NULL | ] [ + ] -- Check constraint can be used as an embedded column -- constraint or as a table constraint. Even with the continued growth of commercial Web commerce, batch processing will remain an important method of processing database work. Similarly for an employee who does not match any customers, the columns pertaining to the Customer table will be blank. The effect of applying the undo operator multiple times is the same as applying undo one time. In the distributed database design and physical database design phases, analysis functions can suggest decisions about data location and index selection. The SQL Tuning Advisor makes recommendations about inadequate statistics, index usage, and coding practices. 52. What is a key column? M-N Relationships with Attributes As briefly mentioned in Section 5.1, relationships can have attributes. Cloud deployment can be public (open to any organization), community (open to cooperating organizations), or hybrid (combination of a public or community cloud and private cloud). Business requirements are rarely well structured. In a fuzzy checkpoint, the recovery manager only writes the buffer pages since the previous checkpoint. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database to assist physical plant personnel in managing assignments of keys to employees. The unique LetterNo field has been added as a convenient identifier of a disclosure letter. You need to identify the matching columns for each join. Appendix 15. A SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the constraint timing clause, the SET CONSTRAINTS statement, the SET TRANSACTION statement, and the save point statements discussed in the chapter. Thus, an offering should not be inserted without a related course. In the parallel approach, such conflicts are not detected until the final step. Person PerNo NamePerCity PerZip Student PerNo FK CourseNo Registers HasCrsDesc CrsUnits PerNo (FK) FacSalary FcRank FacHireDate FaCPerNo (FK) SuperVises Teaches Offering Enrollment OfferNo (FK) FcOffer Grade OfferNo GrpOffer OffLocation OffTime CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides the Prepare() procedure to reuse the access plan. In contrast, the number of result columns is the sum of the columns of the two input tables. The logical database design phase consists of two refinement activities: conversion and normalization. Variations to the Star Schema The star schema in Figure 16.9 represents only a single business process for sales tracking. Applying the Simple synthesis Procedure To understand this procedure, you can apply it to the FDs of the university database table repeated in Table 7-7 for ease of reference. For example, SQL%RowCount denotes the number of rows in an implicit cursor. 1.5 Calculate the average number of physical record accesses to find a key that does not exist in an unorderd sequential file and an ordered sequential file. When pressed, Professor Bayer only said that the B represents the B example. Use the LIKE operator along with the pattern-matching character \* to perform prefix matching? CREATE and DROP ROLE Statements CREATE ROLE RoleName [ WITH ADMIN USERNAME ] CURRENT\_ROLE [ | CASCADE ] RESTRICT ] ; GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for privileges REVOKE [ GRANT OPTION FOR ] \* ON ObjectName FROM UserName [ WITH GRANT OPTION ] ; SELECT [ (ColumnName)\* ] DELETED [ ] INSERT [ (ColumnName)\* ] UPDATE [ (ColumnName)\* ] JUSAGE [ ] TRIGGER [ UNDER ] EXECUTE [ ] ; -- GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for roles REVOKE [ GRANT OPTION FOR ] RoleName FROM UserName [ GRANTED BY [ CURRENT\_USER | CURRENT\_ROLE ] ] ; CASCADE ] RESTRICT ] ; DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE DOMAIN AND DROP DOMAIN Statements CREATE DOMAIN DomainName DataType [ CHECK ] ; -- initially defined in Chapter 4 and extended in Chapter 9 DROP ASSERTION AssertionName [ CASCADE ] RESTRICT ] CHECK Constraint Clause in the CREATE TABLE Statement CREATE TABLE TableName [ \* ] : ColumnName DataType [ DEFAULT DefaultValue | USER | NULL | ] [ + ] -- Check constraint can be used as an embedded column -- constraint or as a table constraint. Even with the continued growth of commercial Web commerce, batch processing will remain an important method of processing database work. Similarly for an employee who does not match any customers, the columns pertaining to the Customer table will be blank. The effect of applying the undo operator multiple times is the same as applying undo one time. In the distributed database design and physical database design phases, analysis functions can suggest decisions about data location and index selection. The SQL Tuning Advisor makes recommendations about inadequate statistics, index usage, and coding practices. 52. What is a key column? M-N Relationships with Attributes As briefly mentioned in Section 5.1, relationships can have attributes. Cloud deployment can be public (open to any organization), community (open to cooperating organizations), or hybrid (combination of a public or community cloud and private cloud). Business requirements are rarely well structured. In a fuzzy checkpoint, the recovery manager only writes the buffer pages since the previous checkpoint. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database to assist physical plant personnel in managing assignments of keys to employees. The unique LetterNo field has been added as a convenient identifier of a disclosure letter. You need to identify the matching columns for each join. Appendix 15. A SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the constraint timing clause, the SET CONSTRAINTS statement, the SET TRANSACTION statement, and the save point statements discussed in the chapter. Thus, an offering should not be inserted without a related course. In the parallel approach, such conflicts are not detected until the final step. Person PerNo NamePerCity PerZip Student PerNo FK CourseNo Registers HasCrsDesc CrsUnits PerNo (FK) FacSalary FcRank FacHireDate FaCPerNo (FK) SuperVises Teaches Offering Enrollment OfferNo (FK) FcOffer Grade OfferNo GrpOffer OffLocation OffTime CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides the Prepare() procedure to reuse the access plan. In contrast, the number of result columns is the sum of the columns of the two input tables. The logical database design phase consists of two refinement activities: conversion and normalization. Variations to the Star Schema The star schema in Figure 16.9 represents only a single business process for sales tracking. Applying the Simple synthesis Procedure To understand this procedure, you can apply it to the FDs of the university database table repeated in Table 7-7 for ease of reference. For example, SQL%RowCount denotes the number of rows in an implicit cursor. 1.5 Calculate the average number of physical record accesses to find a key that does not exist in an unorderd sequential file and an ordered sequential file. When pressed, Professor Bayer only said that the B represents the B example. Use the LIKE operator along with the pattern-matching character \* to perform prefix matching? CREATE and DROP ROLE Statements CREATE ROLE RoleName [ WITH ADMIN USERNAME ] CURRENT\_ROLE [ | CASCADE ] RESTRICT ] ; GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for privileges REVOKE [ GRANT OPTION FOR ] \* ON ObjectName FROM UserName [ WITH GRANT OPTION ] ; SELECT [ (ColumnName)\* ] DELETED [ ] INSERT [ (ColumnName)\* ] UPDATE [ (ColumnName)\* ] JUSAGE [ ] TRIGGER [ UNDER ] EXECUTE [ ] ; -- GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for roles REVOKE [ GRANT OPTION FOR ] RoleName FROM UserName [ GRANTED BY [ CURRENT\_USER | CURRENT\_ROLE ] ] ; CASCADE ] RESTRICT ] ; DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE DOMAIN AND DROP DOMAIN Statements CREATE DOMAIN DomainName DataType [ CHECK ] ; -- initially defined in Chapter 4 and extended in Chapter 9 DROP ASSERTION AssertionName [ CASCADE ] RESTRICT ] CHECK Constraint Clause in the CREATE TABLE Statement CREATE TABLE TableName [ \* ] : ColumnName DataType [ DEFAULT DefaultValue | USER | NULL | ] [ + ] -- Check constraint can be used as an embedded column -- constraint or as a table constraint. Even with the continued growth of commercial Web commerce, batch processing will remain an important method of processing database work. Similarly for an employee who does not match any customers, the columns pertaining to the Customer table will be blank. The effect of applying the undo operator multiple times is the same as applying undo one time. In the distributed database design and physical database design phases, analysis functions can suggest decisions about data location and index selection. The SQL Tuning Advisor makes recommendations about inadequate statistics, index usage, and coding practices. 52. What is a key column? M-N Relationships with Attributes As briefly mentioned in Section 5.1, relationships can have attributes. Cloud deployment can be public (open to any organization), community (open to cooperating organizations), or hybrid (combination of a public or community cloud and private cloud). Business requirements are rarely well structured. In a fuzzy checkpoint, the recovery manager only writes the buffer pages since the previous checkpoint. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database to assist physical plant personnel in managing assignments of keys to employees. The unique LetterNo field has been added as a convenient identifier of a disclosure letter. You need to identify the matching columns for each join. Appendix 15. A SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the constraint timing clause, the SET CONSTRAINTS statement, the SET TRANSACTION statement, and the save point statements discussed in the chapter. Thus, an offering should not be inserted without a related course. In the parallel approach, such conflicts are not detected until the final step. Person PerNo NamePerCity PerZip Student PerNo FK CourseNo Registers HasCrsDesc CrsUnits PerNo (FK) FacSalary FcRank FacHireDate FaCPerNo (FK) SuperVises Teaches Offering Enrollment OfferNo (FK) FcOffer Grade OfferNo GrpOffer OffLocation OffTime CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides the Prepare() procedure to reuse the access plan. In contrast, the number of result columns is the sum of the columns of the two input tables. The logical database design phase consists of two refinement activities: conversion and normalization. Variations to the Star Schema The star schema in Figure 16.9 represents only a single business process for sales tracking. Applying the Simple synthesis Procedure To understand this procedure, you can apply it to the FDs of the university database table repeated in Table 7-7 for ease of reference. For example, SQL%RowCount denotes the number of rows in an implicit cursor. 1.5 Calculate the average number of physical record accesses to find a key that does not exist in an unorderd sequential file and an ordered sequential file. When pressed, Professor Bayer only said that the B represents the B example. Use the LIKE operator along with the pattern-matching character \* to perform prefix matching? CREATE and DROP ROLE Statements CREATE ROLE RoleName [ WITH ADMIN USERNAME ] CURRENT\_ROLE [ | CASCADE ] RESTRICT ] ; GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for privileges REVOKE [ GRANT OPTION FOR ] \* ON ObjectName FROM UserName [ WITH GRANT OPTION ] ; SELECT [ (ColumnName)\* ] DELETED [ ] INSERT [ (ColumnName)\* ] UPDATE [ (ColumnName)\* ] JUSAGE [ ] TRIGGER [ UNDER ] EXECUTE [ ] ; -- GRANT statement for roles GRANT RoleName TO UserName [ WITH ADMIN OPTION ] ; REVOKE statement for roles REVOKE [ GRANT OPTION FOR ] RoleName FROM UserName [ GRANTED BY [ CURRENT\_USER | CURRENT\_ROLE ] ] ; CASCADE ] RESTRICT ] ; DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE DOMAIN AND DROP DOMAIN Statements CREATE DOMAIN DomainName DataType [ CHECK ] ; -- initially defined in Chapter 4 and extended in Chapter 9 DROP ASSERTION AssertionName [ CASCADE ] RESTRICT ] CHECK Constraint Clause in the CREATE TABLE Statement CREATE TABLE TableName [ \* ] : ColumnName DataType [ DEFAULT DefaultValue | USER | NULL | ] [ + ] -- Check constraint can be used as an embedded column -- constraint or as a table constraint. Even with the continued growth of commercial Web commerce, batch processing will remain an important method of processing database work. Similarly for an employee who does not match any customers, the columns pertaining to the Customer table will be blank. The effect of applying the undo operator multiple times is the same as applying undo one time. In the distributed database design and physical database design phases, analysis functions can suggest decisions about data location and index selection. The SQL Tuning Advisor makes recommendations about inadequate statistics, index usage, and coding practices. 52. What is a key column? M-N Relationships with Attributes As briefly mentioned in Section 5.1, relationships can have attributes. Cloud deployment can be public (open to any organization), community (open to cooperating organizations), or hybrid (combination of a public or community cloud and private cloud). Business requirements are rarely well structured. In a fuzzy checkpoint, the recovery manager only writes the buffer pages since the previous checkpoint. In performing your analysis, you may want to follow the approach presented in Section 6.1. Design a database to assist physical plant personnel in managing assignments of keys to employees. The unique LetterNo field has been added as a convenient identifier of a disclosure letter. You need to identify the matching columns for each join. Appendix 15. A SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the constraint timing clause, the SET CONSTRAINTS statement, the SET TRANSACTION statement, and the save point statements discussed in the chapter. Thus, an offering should not be inserted without a related course. In the parallel approach, such conflicts are not detected until the final step. Person PerNo NamePerCity PerZip Student PerNo FK CourseNo Registers HasCrsDesc CrsUnits PerNo (FK) FacSalary FcRank FacHireDate FaCPerNo (FK) SuperVises Teaches Offering Enrollment OfferNo (FK) FcOffer Grade OfferNo GrpOffer OffLocation OffTime CourseNo = 'IS480' CourseNo IS480 CrsDesc FUNDAMENTALS OF DATABASE MANAGEMENT CrsUnits 4 For conditions on string columns, case sensitivity is an important issue. In an ideal world, DBMSs would only track hot spots. If a dynamic statement is repetitively executed by an application, the SQL:2011 CLI provides





applications • Secondary motivation for database programming languages: efficiency and portability • Statement-level interface to support embedded SQL in a programming language • Call-level interface to provide procedures to invoke SQL statements in a programming language • Popularity of proprietary call-level interfaces (ODBC and JDBC) instead of the SQL:2011 call-level interface • Support for static and dynamic binding of SQL statements in statement-level interfaces • Support for dynamic binding with access plan reuse for repetitive executions in call-level interfaces • Implicit versus explicit database connections • Usage of cursors to integrate set-at-a-time processing of SQL with record-at-a-time processing of programming languages • PL/SQL data types and variable declaration • Anchored variable declaration in PL/SQL • Conditional statements in PL/SQL: IF-THEN, IF-THEN-ELSE, IF-THEN-ELSIF, and CASE • Looping statements in PL/SQL: FOR LOOP, WHILE LOOP, and LOOP with an EXIT statement • Anonymous blocks to execute PL/SQL statements and test stored procedures and triggers • Motivations for stored procedures: compilation of access plans, flexibility in client-server development, implementation of complex operators, and convenient management using DBMS tools for security control and dependency management • Specification of parameters in PL/SQL procedures and functions • Exception processing in PL/SQL procedures and functions • Using static cursors in PL/SQL procedures and functions • Implicit versus explicit cursors in PL/SQL • PL/SQL packages to group related procedures, functions, and other objects • Public versus private specification of packages • Typical uses of triggers in business applications: complex integrity constraints, transition constraints, update STORED PROCEDURES AND TRIGGERS - CHAPTER 11 propagation, exception reporting, audit trails, and support for generalization hierarchies • Trigger granularity: statement versus row-level triggers • Trigger timing: before or after an event • Trigger events: INSERT, UPDATE, or DELETE as well as compound events with combinations of these events • SQL:2011 trigger specification versus proprietary trigger syntax • Oracle BEFORE ROW triggers for complex integrity constraints, transition constraints, and data entry standardization • Oracle AFTER ROW triggers for update propagation and exception reporting • Most common trigger coding error: trigger table appears in a SELECT statement in the trigger body • Avoid most common trigger coding error by using the NEW and OLD keywords to access column values of the trigger table • Oracle INSTEAD OF triggers that execute in place of manipulation operations on views • The order of trigger execution in a trigger execution procedure: BEFORE STATEMENT, BEFORE ROW, AFTER ROW, AFTER STATEMENT • The order of integrity constraint enforcement in a trigger execution procedure • Arbitrary execution order for overlapping triggers • Recursive execution of a trigger execution procedure for data manipulation statements in a trigger body and actions on referenced rows • Mutating table errors in Oracle triggers and approaches to avoid mutating table errors Questions 1. For each loan, the loan number, outstanding balance, and interest rate are shown. Define an ERD for the following narrative. Thus, this chapter emphasizes the more limited goal of analyzing narrative problems as a step to developing data modeling skills for real business situations. Table 16-1: Comparison of Operational Databases and Data Warehouses Characteristic Currency Detail level Orientation Number of records processed Normalization level Update level Data model Operational Database Current Individual Process orientation Few Mostly normalized Volatile Relational Data Warehouse Historical Individual and summary Subject orientation Thousands Frequent violations of BCNF Nonvolatile (refreshed) Relational model with star schemas and multidimensional model with data cubes Data integrity and usage patterns of transaction processing require that operational databases be highly normalized. The constellation schemas contain 94 dimension tables and 32 fact tables. Can you define a functional dependency for an M-N relationship without attributes? 16.1.2 Characteristics of Data Warehouses Data warehouse, a term coined by William Inmon in 1990, refers to a central data repository where data from operational

highly normalized. The constellation schemas contain 94 dimension tables and 32 fact tables. Can you define a functional dependency for an M-N relationship without attributes? 16.1.2 Characteristics of Data Warehouses Data warehouse, a term coined by William Inmon in 1990, refers to a central data repository where data from operational databases and other sources are integrated, cleaned, and standardized to support business intelligence. Forms are an important source of requirements because they are common and easily communicated. You should take care when removing redundant relationships, as removing a necessary relationship is a more serious error than retaining a redundant relationship. ERD Effect Add entity types to the ERD. Example 11.27: Trigger to Update the Number of Enrolled Students in an Offering CREATE OR REPLACE TRIGGER tr\_Enrollment\_IA -- This trigger updates the number of enrolled -- students in the related Offering row. Explain the join operator style for join operations. 619 620 CHAPTER 17 - DATA INTEGRATION PRACTICES / RELATIONAL DBMS EXTENSIONS Input data from source file First Name: Mary Last Name: Jones Title: Financial Analyst II Address: First National Bank Building Unit: Suite 400 City: Denver State: CO Postal Code: 80217-4556 Corrected data in target file First Name: Mary Middle Name: Elizabeth Last Name: Jones, Title: Financial Analyst II Firm: Security Unlimited Street Number: 100 Street: First Street Unit: Suite 400 City: Denver State: CO Postal Code: 80217-4556 Figure 17.3 Completed Missing Values through an Investigation Standardization involves business rules to transform values into preferred representations. Data integration tools, presented in the next section, support nonprocedural specification for many data cleaning techniques. For example, if OfferNo was included in the list of columns, the result table would have nine rows with no duplicate removal necessary. Table 8-11 lists SQL statements and frequencies for these tables. By default, sorting occurs in ascending order. In conditions and result columns, expressions can be used in any place that column names appear. The GQM provides forms and interview guidelines to help define a set of goals for the data warehouse. What is a functional dependency? References for Further Study The subject of normalization can be much more detailed than described in this chapter. All views are at least read-only. Diagramming techniques are used to document processes, data, and environment interactions. The conceptual data modeling phase is performed as part of the systems analysis phase. However, some transactions may not need this level of concurrency control. The use of identification dependency is necessary for associative entity types. Show the result of a one-sided outer join between the Employee and OrderTbl tables. To apply these techniques, a practice problem for a water utility database was presented. Using Oracle (either 11.2g or 12c), write a SELECT statement to list the customer name, security symbol, and the number of shares held for each stock held by Denver customers. Example 4.25: Sorting on a Single Column List the GPA, name, city, and state of juniors. QUERY FORMULATION WITH SQL - CHAPTER 4 4.5.3 Self-Joins and Multiple Joins between Two Tables Example 4.42 demonstrates a self-join, a join involving a table with itself. Investigate tools for managing access plans of an enterprise DBMS. However, the denormalized design avoids the outer join operator to combine the tables. The ON ERROR statement in Figure 15.1 detects abnormal termination. Figure 1.7 depicts a graphical tool available in Microsoft Access. See also data model and environment interaction model. How are compound events specified in a trigger? Transaction A then tries to obtain an exclusive lock on the row containing electronic good 2 but is blocked because transaction B holds an exclusive lock. The Generalization Hierarchy Rule (see Section 6.4.3) is applied to convert the student generalization hierarchy in Figure 11.2 into tables as shown in Example 11.34. Next, this section presents parallel processing to improve database performance, an increasingly popular alternative. Scaled-down versions of a system, known as prototypes, are used to clarify requirements. Refresh Constraint: a constraint on a data warehouse or a source system that limits the details of a refresh process. Summary measures derived from a collection of cells may be stored or computed depending on the number of cells and the cost of accessing the cells for the computation. Main memory is typically volatile. The type can have various values including ATM, next check number, deposit, and debit card. The data access driver converts the SQL statement into the SQL supported by the DBMS and then routes the request to the DBMS. When the trigger in Example 11.25 fires for an INSERT statement, the old values are null. The ERD should be general enough to support the form and other anticipated processing. In the UPDATE statement, you should not use an order number, customer number, or product number constant. For example, if only binary relationships are supported, M-way relationships must be represented as an associative entity type with 1-M relationships. A solid relationship line indicates an identifying relationship. The primary key of Enrollment is a combination of StdNo and OfferNo. 5.3 Classification in the Entity Relationship Model People classify entities to better understand their environment. As an example of the first rule, the maximum cardinality is one in the relationship from Order to Customer and from Order to Salesperson. For example, information systems for processing insurance claims must manage traditional data such as account numbers, claim amounts, and accident dates as well as nontraditional data such as images, maps, and drawings. Discretionary access control is the most common kind of security control supported by commercial DBMSs. Mandatory access controls are less flexible than discretionary access controls. Nonprocedural languages do not have looping statements (for, while, and so on) because only the parts of a database to retrieve are specified. If an event request is approved, one or more event plans are made. At the bottom, faculty members without subordinates reside. What kinds of support can a CASE tool provide for documenting a database design? Ravenna Denver CO 80111-0033 \$200.00 C2388597 Beth Taylor 2396 Rafter Rd Seattle WA 98103-1121 \$500.00 C3340959 Betty Wise 4334 153rd NW Seattle WA 98178-3311 \$200.00 C3499503 Bob Mann 1190 Lorraine Cir. SQL Domains In Chapter 3, standard SQL data types were defined. 553 554 CHAPTER 15 - TRANSACTION MANAGEMENT There are several hot spots common to each transaction boundary choice. Trigger execution procedures can be complex because the actions of a trigger may fire other triggers. In Figure 7.2, it is easy to spot the dependencies where StdNo is the determinant. For the ERDs in Figure 7.P7, describe assumptions under which the ERDs correctly depict the relationships among work assignments, tasks, and materials. In the stand-alone context, the user submits SQL statements with the use of a specialized editor. Each category includes a category number and name. A frequent query is to list the most recent valuation for each asset held by a customer. You do not need to test each public object completely. The SQL ROLLBACK statement can abort a transaction if an abnormal condition occurs. In step 4, a new table (Student2) is added with Email as the primary key. (3) After releasing a lock, the transaction does not acquire any new locks. In practice, the one-sided outer join approach is the most restrictive as many problems involve conditions on the excluded table. Cursor: a construct in a database programming language that allows storage and iteration of a set of records returned by a SELECT statement. Table 11-3: List of SQL \*Plus Commands useful in the SQL Developer Command SET SHOW SPOOL / Example and Meaning SET SERVEROUTPUT ON causes the results of PL/SQL statements to be displayed. Using a Type I nested query is the standard way to reference related tables in DELETE statements. This subsection discusses three primary motivations (customization, batch processing, and data intensive Web applications) for using a database programming language and two secondary motivations (efficiency and portability). Since the SQL standard supports integrity constraints in the CREATE TABLE statement (see Chapter 3) for simple rules and a formal rules language (see Chapters 11 and 14) for complex constraints, a language is not proposed here for ERDs. In the absence of a formal rules language, business rules can be stored as informal documentation associated with entity types, attributes, and relationships. Even a modest-size database can have 10 to 15 tables. What level of detail should be provided for form definitions to support the form analysis process? For example, multiple groupings are needed to summarize the number of students per offering and the number of resources per offering. BCNF covers two special cases not covered by 3NF: (1) part of a key determines part of a key and (2) a nonkey column determines part of a key. The MTTR Advisor also determines the log file size that is considered optimal based on the current setting of the MTTR parameter. Because some time may elapse before a parent node is accessed again, the operating system may replace it with another physical record if main memory becomes full. The website contains labs for four Microsoft Access versions (2003, 2007, 2010, and 2013) as well as practice databases and exercises. Cursor: a construct in a database programming language that allows storage and iteration through a set of records returned by a SELECT statement. Student Loan Limited is required to retain copies of loan activity reports in case the guarantor needs to review the loan processing of a student. Sometimes after a subset of columns is retrieved, there are duplicate rows. This solution restricts the customer to having only a single shipping address. However, the performance of the equal-height histogram can be easily improved by doubling the ranges with no noticeable performance overhead. For flat (nonhierarchical) dimensions, there is only a single level in a dimension. Figure 5.32 shows an association class that represents an M-N relationship between the Student and the Offering classes. Even though a student is enrolled in an offering and the offering uses a textbook, the student may not purchase the textbook (perhaps borrow it) for the offering. The null value effects described in this section are specified in the SQL standards (1992 through 2011). You also learned about PL/SQL packages that group related procedures, functions, and other PL/SQL objects. In the Crow's Foot notation as well as most other notations, rectangles denote entity types.

PHYSICAL DATABASE DESIGN - CHAPTER 8 49. Because divide has more stringent matching conditions, it is not as widely used as join, and it is more difficult to understand. References for Further Study This chapter has provided a detailed introduction to a broad and deep subject. If you ignore an FD in the normalization process, you should note that it exists but will not lead to any significant anomalies. In contrast, a disk drive (magnetic or solid state) is nonvolatile because it retains its state if power is lost. Inheritance means that the attributes of a supertype are automatically part of its subtypes. A project is divided into a number of programs. The full execution procedure shows considerable complexity when executing a trigger. In each case, choose appropriate names for the relationships and describe the meaning of the relationships. A user can access a database element if the user's clearance level provides access to the classification level of the element. Show the result of each step in the procedure. Desktop DBMSs are designed to run on personal computers and small servers. How is an M-N relationship represented in the Relational Model? One usage of nested queries in the FROM clause is to compute an aggregate function within an aggregate function (nested aggregates). What makes a query ambiguous? What is the primary key of the table? The duration includes not only the number of reads and writes to the database but the time spent waiting for user responses. For simplicity, decisions about other outputs are made separately even though the outputs can be related. Despite the familiarity and simplicity of relational databases, there is a strong mathematical basis also. The trigger should prevent updates that increase or decrease the commission rate by more than 10 percent of the previous commission rate. Chapter 6 discusses these issues to enhance your data modeling skills. A A1 A1 A1 A1 B B1 B2 B1 C C1 C2 C1 C2 Figure 7.10: Table Representation of an MVD To apply this concept to the Enrollment table, consider the possible MVD OfferNo →→ StdNo | TextNo. In the first two rows of Figure 7.11, offering O1 is associated with students S1 and S2 and textbooks T1 and T2. In the fifth step, the effectiveness of mitigation techniques are evaluated using data collected from data consumers. See also join and natural join. The client may perform additional processing on the data before displaying the results to the user. Explain how the 1-M relationship in the statement of account is represented in the ERD of Figure 13.13. SELECT Faculty.FacNo, FacFirstName, FacLastName FROM Faculty, Offering, Enrollment, Student WHERE Faculty.FacNo = 'FALL' AND CourseNo LIKE 'IS%' AND OffYear = 2012 AND StdClass = 'SR' AND Offering.OfferNo = Enrollment.OfferNo AND Student.StdNo = Enrollment.StdNo GROUP BY Faculty.FacNo, FacFirstName, FacLastName HAVING COUNT(DISTINCT Student.StdNo) = ( SELECT COUNT(\*) FROM Student WHERE StdClass = 'SR' ); FacNo 098-76-5432 FacFirstName LEONARD

OffYear = 2012 AND StdClass = 'SR' AND Offering.OfferNo = Enrollment.OfferNo AND Student.StdNo = Enrollment.StdNo GROUP BY Faculty.FacNo, FacFirstName, FacLastName HAVING COUNT(DISTINCT Student.StdNo) = ( SELECT COUNT(\*) FROM Student WHERE StdClass = 'SR' ); FacNo 098-76-5432 FacFirstName LEONARD FacLastName VINCE Example 9.32 (Access): Another Division Problem Using Nested Queries in the FROM Clauses Instead of the DISTINCT Keyword inside the COUNT Function List the faculty who have taught all seniors in their fall 2012 information systems offerings. Redesign the online shopping transaction (Figure 15.3) to remove user interaction. Abe, Denver, ... APPLICATION DEVELOPMENT WITH VIEWS - CHAPTER 10 24. When do you use a path expression? Include an offering in the result even if the faculty is not yet assigned. Although one would not normally consider FDs with OffTerm as a LHS, the elimination technique may be useful for plausible LHS columns such as OfferNo and StdNo. 2 This concept is more properly known as "full functional dependence." Full functional dependence means that the LHS is minimal. A user can access an object if the user's clearance level provides access to the classification level of the object. Meaning Entity type with attributes (primary key underlined) M-N relationship with attributes: attributes are shown if room permits; otherwise attributes are listed separately. Column values using VARCHAR contain only the actual number of characters, not the maximum length for CHAR columns. Each contractor has exactly one specialty, but many contractors can provide the same specialty. The following points explain why UnivTable5 is in 3NF but not in BCNF. However, the Loan, Student, and Institution tables violate BCNF as these tables have determinants that are not candidate keys. For example, usage of foreign keys in an ERD is due to confusion about relationship representation in the two models. The precision parameter P indicates the number of significant digits. Finally, you will learn to represent similarities among entity types using generalization hierarchies. Both DBAs and DAs can use an IRD to manage information resources. See also indirect user and parametric user. The final ERD should be the same whether you use the incremental or the parallel approach. • Overviews provide a snapshot or preview of chapter contents. Distributed database technology supports local control of data, data sharing for requests involving data from more than one site, and reduced communication overhead. Example 11.2 demonstrates anchored variable declarations using columns from the revised university database of Chapter 10. Most division problems can be written with adjectives every or all between a verb phrase representing a table and a noun representing another table. You are encouraged to work cases available through the textbook's website to solidify your understanding of the database development process. To fulfill the goals of database development, the database development process must be tightly integrated with other parts of information systems development. Product ProdNo ProdName ProdSupplier ProdPrice Figure 6.P11: Product Entity Type without Price History 28. Only show the common columns in the result. Cardinality: a constraint on the number of entities participating in a relationship. A category has a unique category identifier, a name, a type (expense, asset, liability, or revenue), and a balance. Many of the FDs in Table 7-6 violate the 2NF definition because the combination of VisitNo and ProvNo is the primary key. A business analyst may become confused because of the inconsistent totals. Existence Dependency: an entity that cannot exist unless another related entity exists. The backslash () escape character removes the meaning of a metacharacter allowing a metacharacter to be used as a literal. For most constraints such as primary and foreign keys, immediate enforcement is appropriate. 10 \$319.00 2/20/2013 P1114590 R3000 Color Laser Printer Connex 5 \$699.00 1/22/2013 P1412138 10 Foot Printer Cable Ethlite 100 \$12.00 P1445671 8-Outlet Surge Protector Intersafe 33 \$14.99 P1556678 CVP Ink Jet Color Printer Connex 8 \$99.00 1/22/2013 P3455443 Color Ink Jet Cartridge Connex 24 \$38.00 1/22/2013 P4200344 36-Bit Color Scanner UV Components 16 \$199.99 1/29/2013 P6677900 Black Ink Jet Cartridge Connex 44 \$25.69 P9995676 Battery Back-up System Cybercx 12 \$89.00 2/1/2013 Employee EmpNo 1. A graphical representation such as the Relationship window THE RELATIONAL DATA MODEL - CHAPTER 3 in Microsoft Access provides a powerful tool to conceptualize referential integrity constraints. Note that the DISTINCT keyword is not necessary for the nested query because only rows of the Student table are counted. Problems The problems use the extended order entry database depicted in Figure 10.P1 and Table 10-P1. The database for the actual information system is more than 150 tables. Now, it is the typical capacity of hard drives on personal computers. Table 2-1: Common Characteristics of Data Quality Characteristic Completeness Lack of ambiguity Correctness Timeliness Reliability Consistency Meaning Database represents all important parts of the information system. Convert the ERD shown in Figure 6.CP5 into tables. Understanding the nature of the performance measure helps one to interpret choices made by the optimization software. Examples 17.13 to 17.15 depict the syntax of the CREATE MATERIALIZED VIEW statement. Example 8.3: Oracle CREATE INDEX statements CREATE UNIQUE INDEX StdNoIndex ON Student (StdNo) CREATE UNIQUE INDEX FacNoIndex ON Faculty (FacNo) CREATE UNIQUE INDEX StdGPAIndex ON Student (StdGPA) CREATE UNIQUE INDEX

Data Quality Characteristic Completeness Each of the quality correctness, timeliness, reliability, consistency, and integrity. Modeling Database represents an important part of the information system. Convert the ERD shown in Figure 8.31-3 into tables. Understanding the nature of the performance measure helps one to interpret choices made by the optimization software. Examples 17.13 to 17.15 depict the syntax of the CREATE MATERIALIZED VIEW statement. Example 8.3: Oracle CREATE INDEX StdNoIndex ON Student (StdNo) CREATE UNIQUE INDEX FacNoIndex ON Faculty (FacNo) CREATE INDEX StdGPAIndex ON Student (StdGPA) CREATE UNIQUE INDEX OfferNoIndex ON Offering (OfferNo) CREATE INDEX EnrollOfferNoIndex ON Enrollment (OfferNo) CREATE BITMAP INDEX OffYearIndex ON Offering (OffYear) CREATE BITMAP INDEX FacRankIndex ON Faculty (FacRank) CREATE BITMAP INDEX FacDeptIndex ON Faculty (FacDept) 8.6 Additional Choices in Physical Database Design Although index selection is the most important decision of physical database design, there are other decisions that can significantly improve performance. Locks held The third condition is usually simplified so that at least exclusive locks are held until the end of the transaction. Management Hierarchy Top (strategic) Middle (tactical) Lower (operational) External data sources and summarized, tactical databases Cleaned and integrated operational databases Individual operational databases Operational databases Figure 14.1: Database Support for Management Levels Table 14-1 provides examples of management decisions and data requirements. In the alternative ERD (Figure 12.8), the maximum cardinality is M from Order to Product. The second part describes workflow specification for maintaining a data warehouse. Violating these rules is a warning, not necessarily an error. See also deferred update approach and write ahead log protocol. At the storage level, a database consists of physical records (also known as blocks or pages) organized into files. Therefore, the database design must be modified. Step 4: Add Relationships In the fourth step, you connect entity types with relationships and specify cardinalities. The results of union, intersection, and difference operators are shown in Tables 3-25 through 3-27, respectively. Batra (1997) provides a more recent update to this work on form analysis. If the tool finds an attribute with the same name and data type, a violation is listed in the rule violation report. However, Access 2007 and later versions dropped support for application-level security, instead relying on SQL security constraints and improved control of components that may pose security risks. For example, StdNo is a determinant but not a candidate key (it is part of a candidate key but not a candidate key by itself). Shared Everything (SE) Architecture: an architecture for parallel database processing in which memory and disks are shared among a collection of processors. DEVELOPING DATA MODELS FOR BUSINESS DATABASES - CHAPTER 6 Design Documentation: include justification for design decisions involving multiple feasible choices and explanations of subtle design choices. Essentially, candidate keys do not have extra columns. Using SQL:2011, insert an object into the typed Bond table for an IBM corporate bond. A value-based constraint involves a comparison of a column to a constant using a comparison operator such as . Appendix 13.B shows CREATE TABLE statements with the revised list of tables. In addition, course numbers are shorter requiring less space to store in related tables. With multiple legs, a lock on the first leg should be granted before a lock on the second leg, however. How is the measure used in the objective related to waiting time? Some DBMSs even allow dynamic database sampling at optimization time, but normally this level of data currency is not needed. For the query in problem 47, modify the query to remove unnecessary joins. Although data warehouses largely contain replicated data, populating and maintaining a data warehouse is much more complex than copying source data. SELECT FacFirstName, FacLastName, O1.CourseNo FROM Faculty, Offering O1, Offering O2 107 108 CHAPTER 4 - QUERY FORMULATION WITH SQL WHERE AND AND AND Faculty.FacNo = O1.FacNo Faculty.FacSupervisor = O2.FacNo O1.OffYear = 2013 AND O2.OffYear = 2013 O1.CourseNo = O2.CourseNo FacFirstName FacLastName CourseNo LEONARD VINCE IS320 LEONARD FIBON IS320 If this problem is too difficult, use the conceptual evaluation process (Figure 4.2) with sample tables to gain insight. • Ranking functions support requests for the top or the bottom percentage of results. INTRODUCTION TO DATABASE DEVELOPMENT - CHAPTER 2 2.4.5 Commercial CASE Tools As shown in Table 2-2, there are a number of CASE tools that provide extensive functionality for database development. Information resource management involves similar activities: planning databases, acquiring data, protecting data from unauthorized access, ensuring reliability, coordinating flow among information systems, and eliminating duplication. Why would you use an alternative to an assertion? Other decisions are not so time sensitive. 30. • Modification anomalies: unexpected side effects when inserting, updating, or deleting • Functional dependency: a value neutral constraint similar to a candidate key • Usage of sample data to eliminate possible functional dependencies • 2NF: nonkey columns dependent on the entire key, not a subset of the key • 3NF: nonkey columns dependent only on the key, not on other nonkey columns • BCNF: every determinant is a candidate key. An entity type representing a group of related entities can be added with an associative entity type that connects the other entity types. What is a grouping column in a hierarchical report? In a trigger supporting insert operations on both parent and child tables (the child table is typically the key preserving table), you should check for existence of the parent row. In Figure 5.5, the TeamTeaches relationship allows multiple professors to jointly teach the same offering, as shown in the instance diagram of Figure 5.6. M-N relationships are common in business databases to represent the connection between parts and suppliers, authors and books, and skills and employees. Otherwise, just insert a row into the OrderTbl table. Summarizable schema patterns eliminate all three dimension summarizability problems. Chapter 10 describes concepts underlying form and report development. Each attribute has a data type defining allowable values and operations. The tSchemaComplianceCheck component rejected two rows for null value or data type violations, passing 10 rows to the tMap component. • Advanced architectures use a two-dimensional arrangement of mirroring and striping. To understand a relational database, connections or relationships among tables also must be understood. Non Strict Dimensions: involves M-N relationships between dimension levels, typically exceptions to 1-M relationships. Storage as XMLType data allows indexing and specialized query optimization. The divide operator is typically applied to linking tables showing M-N relationships. Should you expect to find one software vendor providing a full range of functions (drawing, documenting, analyzing, and prototyping) for the database development process? Conceptually underlies join operator. The RIGHT JOIN keyword creates a result table containing the matching rows and the non-matching rows of the right table. There are two candidate keys for the underlying table: the combination of OrderNo, ItemNo, and PlantNo and the combination of OrderNo, LineNo, and PlantNo. Using the sample data, identify insertion, update, and deletion anomalies in the table. A group of form fields is known as a node. Draw an ERD containing the Order and Customer entity types connected by a 1-M relationship from Customer to Order. Using SQL:2011, insert an object into the typed Holding table. No other transaction states are possible. For example, the first and third rows of the Enrollment table have the same StdNo value (123-45-6789) as the first row of the Student table. PR1 PR2 PR3 PR4 PR5 PR6 PR7 PR8 PR9 PR10 PR11 PR12 Figure 8.33: Striping in RAID Storage Systems To utilize RAID storage, a number of architectures have emerged. Faculty\_1 is not a real table as it is created only inside the Access Relationship window. Nonprocedural access is the most vital element because it allows access without detailed coding. Actions on referenced rows are important when changing the rows of a database. Use the following Airline Reservation database tables and the Flight Reservation Form to answer problems 9.1 to TRANSACTION MANAGEMENT - CHAPTER 15 9.4. Comments are listed after the tables and the form. What SQL:2011 statements and procedures support explicit database connections? For the sample Supplier Form shown in Figure 10.P6, answer the five data requirement questions presented in Section 10.4.3. The main form supports the manipulation of supplier data while the subform supports the manipulation of only the product number and the product name of the products provided by the supplier in the main form. When a foreign key is part of a primary key, null values are not permitted because of the entity integrity rule. What is the purpose of a database diagram such as the Access Relationship window? 2009 Loan No. L100 Student No. Name Address City, State, Zip S100 Sam Student 15400 Any Street Anytown, USA 00999 Date of Birth 11/11/1990 May 2012 Institution Name: University of Colorado 1250 14th Street, Suite 700 Denver CO 80217 EFT Check X Account No. --Lender Name Any Bank USA Guarantor Name Any Guarantor USA Subsidized: No Rate: 4.2% Disbursement Plan Phone (341) 555-2222 Expected Graduation Institution Id: U100 Address City, State, Zip Disbursement Method Routing No. LE100 Guarantor No. G100 Note Value: \$10000 Date 29 Sept. b) Convert the ERD changes to a table design. For these kinds of complex

Subsidized: No Rate: 4.2% Disbursement Plan Phone (341) 555-2222 Expected Graduation Institution Id: U100 Address City, State, Zip Disbursement Method Routing No. LE100 Guarantor No. G100 Note Value: \$10000 Date 29 Sept. b) Convert the ERD changes to a table design. For these kinds of complex constraints, constraint timing should be specified. However, storage of government identifiers such as SSNs may be necessary for compliance with government reporting requirements especially in financial service databases. The approach here uses the COUNT function with a nested query in the HAVING clause. Abnormal termination can be caused by events such as transaction time-out, communication line failure, or programming error (for example, dividing by zero). Some of the characteristics are possible meanings for the letter B1 in the name. After determining the applicable triggers, Oracle executes triggers in the order of BEFORE STATEMENT, BEFORE ROW, AFTER ROW, and AFTER STATEMENT. 125 126 CHAPTER 4 - QUERY FORMULATION WITH SQL 2. In the remainder of this chapter, keep these difficulties in mind. For each object in the package interface, the package body must define an implementation. To help you apply diagram rules, most CASE tools perform checks specific to the notations supported by the tools. The reservation table contains columns for the unique reservation number, date, start time, duration, court, player1, player2, optional player3, and optional player4. However, a function should use only input parameters. Because of its emphasis on subsets of user requirements, the demand-driven approach has some similarity to the view driven approach to database design as described in Chapter 12. • Reviewer information includes the reviewer number, the name, the mailing address, a unique but optional electronic address, and a list of expertise categories. TRANSACTION MANAGEMENT - CHAPTER 15 To ensure that transactions meet the ACID properties, DBMSs provide certain services that are transparent to database developers (programmers and analysts). Student Loan Limited cannot justify the expense of imaging software and hardware. The conceptual evaluation process provides a foundation for understanding the meaning of SQL statements that is independent of system and performance issues. Mail-order companies can increase revenues and decrease costs if they can identify likely customers and eliminate customers not likely to purchase. Uncommitted Dependency An uncommitted dependency occurs when one transaction reads data written by another transaction before the other transaction commits. Key1 Key2 ... When the user clicks on the category field, the category number and name are displayed. The regular and unusual patterns are the two dimension summarizability patterns. The sales of napkin products are omitted in the category level because napkin products are not food or drink. Provide importance weights for your list of detailed requirements from problem 6 using the AHP criteria in Table 14-4. Index set Sequence set 1. Typically, vehicles remain on the lot for a period of time before sales occur. However, not all MVDs are FDs. MVDs in which a column is associated with more than one value of two columns, is a nontrivial MVD. Shortly after a student separates from school, Student Loan Limited sends a disclosure letter. Cloud-based solutions include both traditional relational database products such as Microsoft SQL Azure and Amazon Relational Data Service as well as NoSQL offerings such as Amazon SimpleDB, Oracle Berkeley DB, and MongoDB. Oracle 12c provides the FOLLOWS clause to specify firing order among overlapping triggers. In Figure 3.4, the result table has nine rows and two columns. Compare traditional hard drives and solid state drives on random access times, transfer times, power consumption, reliability, and cost per bit. It is important to note that the join is performed before the grouping occurs. Your comments and reaction to the textbook have been invaluable to its improvement. Two approaches for view

and two columns. Compare traditional hard drives and solid state drives on random access times, transfer times, power consumption, reliability, and cost per bit. It is important to note that the join is performed before the grouping occurs. Your comments and reaction to the textbook have been invaluable to its improvement. Two approaches for view integration are presented along with an example of each approach. Reverse Engineering: the ability to extract definitions from a target database management system and use the definitions to create an ERD and data dictionary properties. In contrast, deletions cascade for the foreign key DisburseLine.LoaNo because disbursement lines are identification dependent on the related loan. The result should include the employee number, last name, and salary of both the employee and supervisor. Rows evaluating to false or null are discarded. All rows in a group have the same values for the GROUP BY columns. In an ERD, an incomplete dimension-fact relationship involves a minimum cardinality of 0 for the fact entity type. To help you grasp this more precise meaning, this section presents examples of transactions and defines properties of transactions. Are the Customer and Employee tables union compatible? What is an incremental checkpoint? Each operator uses one or two tables as input and produces a new table as output. To more fully support workflow management, transaction management should be customized according to workflow requirements. A regular expression (or regex for short) contains literals (exactly matching characters), metacharacters (special meaning characters), and escape characters (remove special meaning of metacharacters). ISStudent has the same columns as Student. Because DBMSs continue to evolve, you must continually update your knowledge. Example 9.12 requires that every row of the Student table be searched to select a faculty row. To demonstrate an extraneous column, suppose there was the FD StdNo, StdCity → StdClass. Appendix 11.A: SQL:2011 Syntax Summary This appendix summarizes the SQL:2011 syntax for the trigger statement. • Visio Professional does not support inheritance as the attributes of Person are not part of its child entity types (Student and Faculty). Your planning process is much easier if you have a professional to help with these additional details. In Example 4.35, you saw it was necessary to combine the Student, Enrollment, Offering, and Faculty tables to find faculty teaching a specified student. Figure 3.1 shows a graphical depiction of the matching values. Remember that a row cannot exist with null values for any part of its primary key. You can also think about functional dependencies as identifying potential candidate keys. Therefore, you should define a referential integrity constraint stating that UnivTable3.StdNo refers to UnivTable1. pr\_DetermineRank('789-01-2005', 5679, aRank, aGrade); IF aRank > 0 THEN dbms\_output.put\_line('Rank is ' || to\_char(aRank) || '.'); dbms\_output.put\_line('Grade is ' || to\_char(aGrade) || '.'); ELSE dbms\_output.put\_line('Student is not enrolled.'); 409 410 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS END IF; END; / PL/SQL supports a number of cursor attributes as listed in Table 11-5. Using SQL:2011, define a user-defined type for a time series. What are the differences between SQL:2011 methods, functions, and procedures? Each company must map its positions into the position list maintained by the placement office. This chapter extends your database design skills by demonstrating an approach to analyze views and integrate user views into a complete, conceptual schema. Data about an office include the phone number, the manager name, and the address. The result should include the employee number, last name, and salary of both the employee and supervisor as well as the path from the supervisor to the employee using the last name to identify rows on the path and / as the separator character. • Meter data include a unique meter number, an address, a size, and a model. The grouping column is CustState and the aggregate calculation is COUNT. What is the meaning of an FD with multiple columns on the right-hand side? Example 11.35 contains two views combining the parent and subtype tables. PCTUSED: an Oracle storage parameter. Figure 8.9 demonstrates that records must sometimes be rearranged during the insertion process. The heading part consists of the table name and the column names. The second nested query occurs inside the nested query in the HAVING clause. Convert the ERD shown in Figure 6.CP2 into tables. Documentation standards may include naming standards, explanations of parameters, and descriptions of pre- and post-conditions of procedures. NORMALIZATION OF RELATIONAL TABLES - CHAPTER 7 PatientTable1 (ProvNo, ProvSpecialty) PatientTable2 (VisitNo, VisitDate, PatNo, PatAge, PatCity, PatZip) PatientTable3 (VisitNo, ProvNo, Diagnosis) FOREIGN KEY (VisitNo) REFERENCES PatientTable2 FOREING KEY (ProvNo) REFERENCES PatientTable1 PatientTable1 and PatientTable3 are in 3NF because there are no nonkey columns that determine other nonkey columns. Figure 3.5 shows a join of sample Faculty and Offering tables where the join condition is that the FacNo columns are equal. With an increasing emphasis on storing complex data types such as audio, video, and images, compression is an important issue. The optimal refresh frequency maximizes the net refresh benefit defined as the value of data timeliness minus the cost of refresh. Any other SQL statements between them are part of the transaction. 93 94 CHAPTER 4 - QUERY FORMULATION WITH SQL Example 4.24 (Access): Combining Grouping and Joins Summarize the number of IS course offerings by course description. 507 CREATE TABLE , 42, 45, 46, 47, 48, 30, 48, 49, 51, 52, 68, 69, 70, 71, 72, 73, 74, 75, 77, 79, 80, 113, 126, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 480, 490, 491, 492, 507, 525, 531, 573, 574, 708, 709, 710, 715, 716 CREATE TABLE statement 42, 45, 46, 47, 48, 49, 51, 68, 69, 70, 72, 74, 77, 79, 506, 531 CREATE VIEW 79, 353, 354, 355, 361, 368, 375 Cross-Checking 31 Cross-Product-Style 101 Gray's Fact Representation 122 CTE 225, 226, 227, 247 CUBE Operator 629, 630, 631 Cursor 392, 402, 406, 408, 410, 411 D-Data access 659 Data Administrator 17 Database Connection 392 Database definition 4 Database Management

48, 50, 40, 49, 51, 52, 58, 69, 70, 71, 72, 73, 74, 75, 77, 79, 80, 113, 120, 132, 183, 184, 185, 186, 189, 190, 191, 192, 480, 491, 492, 507, 523, 531, 573, 574, 708, 709, 710, 713, 716 CREATE TABLE statement 42, 43, 46, 47, 48, 49, 51, 58, 69, 70, 72, 74, 77, 79, 306, 331 CROSS CHECKING 31 Cross Product Style 101 Crow's Foot Representation 133 CTE 335, 336, 337, 347 CUBE Operator 628, 629, 630, 631 Cursor 393, 403, 406, 408, 410, 411 D Data access 658 Data access middleware 659 Data Administrator 18 Database administrator 17 Database Backup 547 Database definition 4 Database Management System 4, 735, 747 Database Programming Language 390 Database tuning 4, 9 Data Cleaning 616 Data Cube 582, 583, 584, 585, 586, 588, 642 Data Cube Operators 586, 588 Data Dictionary Manipulation 510 Data entry form 7, 365, 375, 456 Data Governance 498, 499, 513, 516, 524, 529 Data Independence 12, 13, 20 Data Integration Tools 621, 622, 626 Data Intensive Web Applications 391 Data Mart 578 Data mining 580 Data Mining 580 data modeling 28, 30, 31, 32, 34, 37, 38, 39 Data Planning 512 Data quality 27 Data steward 514, 528 Data Type 42, 43 Data Warehouse 522, 575, 576, 577, 579, 581, 582, 600, 601, 602, 603, 604, 605, 606, 607, 612 Data warehouse appliance 642, 643, 644 Data Warehouse Maturity Model 581, 582, 607, 612 DATE/TIME 43 DB2 653, 664, 668, 669, 687, 688 DBMS 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 20, 21, 731, 732, 733, 734, 735, 736, 737, 738, 741, 746, 747, 748, 749, 752, 754, 755 Deadlock 543 DECIMAL 43 Default 51, 74 Deferred Constraint Checking 558 Deferred Update 549, 551 DELETE 51, 72, 77, 79, 111, 112, 113, 116, 117, 125, 280, 282, 293, 296, 308, 309, 339, 341, 353, 359, 360, 361, 375, 490, 491, 492, 535, 676, 677, 678 Delete All Rows in a Table 112 Delete Selected Rows 112 Demand-driven data warehouse design methodology 602, 607 Denormalization 238, 252, 238, 284, 289, 483 Derivation of the Natural Join 56 Design Documentation 179 DGPC Framework 514, 515, 516 Diagramming 25, 33 Diagram Rules 144 Dice 587, 588, 615, 617, 618, 622, 624, 627, 636, 650 Difference 61, 115, 723 Difference Operators 61 Difference Problems 310 Dimension-Fact Relationship Summarizability 595, 596 Dimension-Fact Relationship Summarizability Pattern 596 Dimension-Fact Summarizability 595 Dimensions 584 Dimension Summarizability 591, 592, 593, 594 Dimension Summarizability Patterns 593 Dimension Summarizability Problems 592 Discretionary Access Control 502 Disjointness 142, 674 DISTINCT 91, 92, 95, 102, 114, 115, 117, 126, 127, 305, 306, 311, 314, 315, 316, 317, 318, 321, 322, 339, 341, 348, 351 Distributed Concurrency Control 683 Distributed Data 654, 656 Distributed Database 14, 16 Distributed database design 30, 32, 38, 656 Distributed Object Management 562 Distributed processing 1, 10, 11, 14, 16, 19, 21, 654, 657 Divide 64, 65, 64, 65 Divide Operator 64 Division 318, 319, 320, 321, 322, 657 Division of Processing 657 Division Problems 318, 319, 320 DKNF 224, 237, 240 Documentation 34 DOLAP 643, 646 Domain Key Normal Form 237 Drill-Down 587, 592 Durable 536 Dynamic 261 Dynamic sampling 276 E Encapsulation 696, 700, 722, 723 END TRANSACTION 535, 536, 552, 554, 563 Enterprise Data Model 500 Entity 28, 37, 45 Entity Integrity 45 Entity integrity rule 45 Entity Integrity Variations 46 Entity Matching 620, 621 Entity Relationship Diagram 28, 131, 132, 133, 163, 194, 219, 447, 452, 456, 457, 458, 462 Entity Relationship Stencil 151 Entity type 132, 133, 136, 143, 145, 148, 164, 167, 168, 170, 172, 176, 185 Entity Type Rule 182 Environment interaction model 26 ERD 28, 29, 31, 34, 132, 133, 135, 136, 138, 140, 141, 142, 144, 146, 148, 149, 155, 156, 157, 159, 160, 161, 164, 167, 168, 169, 170, 172, 175, 176, 178, 179, 181, 182, 185, 186, 190, 191, 192, 194, 195, 197, 198, 199, 200, 205, 212, 213, 214, 215, 216, 217, 219, 232, 237, 238, 243, 244, 447, 448, 449, 451, 452, 453, 455, 456, 457, 458, 459, 461, 462, 463, 464, 465, 467, 472, 473, 474, 475, 476, 477, 478, 486, 487, 708, 719, 725 Exabyte 501 Existence Dependency 134 Expanding Attributes 168 Expanding Entity Types 170 Explicit PL/SQL Cursor 408 Expression 80, 84, 89, 126, 127, 128, 129 Extended Cross Product Operator 53 Extended statistics 276, 289 Extensions to SQL for Multidimensional Data 627 Extreme programming 26 Extreme Transaction Processing 664 F FD 221, 225, 226, 227, 229, 230, 231, 236, 238, 240, 241, 242, 247, 479 FDs for 1-M relationships 222 Field 45, 541, 674 Fifth normal form 224, 236, 237, 240 File 10, 252, 257, 258, 259, 268, 269 File structures 10, 257, 268, 269 First normal form 223, 224 Flexibility 654 FLOAT 43 Force writing 547, 564 Foreign key , 67, 478 Form Analysis 449, 450, 453 Fourth normal form 224, 232, 234, 236, 238, 239, 240 Fragmentation transparency 675, 678, 680 FROM Clause 316, 318, 348 FULL JOIN 303, 304, 338 Full Outer Join 59, 60, 68, 303, 304, 350 Functional Dependency 221 G Generalization Hierarchies 141, 143, 154, 175, 186, 188, 284 Generalization Hierarchy Rule 187 GPS Devices 695 GROUP BY , 77, 79, 91, 92, 93, 94, 95, 96, 98, 99, 100, 101, 108, 109, 113, 115, 116, 117, 126, 301, 613, 355, 79, 356, 359, 360, 362, 91, 627, 92, 628, 93, 629, 94, 630, 319, 95, 631, 96, 632, 633, 374, 98, 634, 99, 635, 100, 64, 108, 109, 113, 115, 340, 116, 117 GROUP BY Reminder 91 Grouping 108 Grouping match 639 GROUPING SETS Operator 634, 635 H Hash files 259, 260, 268 Hash Files 259 HAVING 79, 91, 92, 93, 96, 99, 100, 101, 108, 109, 113, 115, 117, 126 Heat Map 288 Hierarchical form 365, 366, 375 hierarchical query 326, 328, 333, 335, 338, 341 Hierarchical Query 326, 328, 329, 330, 331, 332, 335, 346 Hierarchical report 371, 375, 376 History 172, 173, 174, 175, 208, 209 HOLAP 643, 646, 647 Homonyms 460 Hot spot 553, 538 Hybrid data warehouse design methodology 603, 607 Hybrid histogram 254 Hybrid OLAP 643 I Identification dependency 136, 170 Identification Dependency Rule 182 ILM 288, 289 Immediate Update 548, 549, 551 Implicit PL/SOL Cursor; 406 Incorrect Summary 540 Incremental integration 459, 472 Incremental Integration Approach 458 Index matching 249, 278, 279, 280, 289 Inexact matching 86, 87, 113 Information Life Cycle 497 Information Resource Dictionary

Implicit PL/SQL Cursor: 406 Incorrect Summary 540 Incremental integration 459, 472 Incremental Integration Approach 458 Index Matching 265, 266 Index selection 249, 278, 279, 280, 289 Inequality Joins 311 Inexact matching 86, 87, 113 Information Life Cycle 497 Information Lifecycle Management 288, 289, 291 Information Resource Dictionary 511, 527 Information system 17, 24, 37, 38, 524, 690 Information Systems Planning 512, 513 Inheritance 141, 142, 697, 698, 700, 703, 141, 703, 142, 710, 722, 723 INNER JOIN 90, 91, 97, 105, 106, 112, 115, 116, 302, 305, 306, 308, 309, 339, 363, 364, 369, 370, 373, 387, 430, 484 INSERT , 77, 79, 111, 112, 113, 116, 117, 125, 77, 280, 282, 293, 296, 353, 359, 360, 361, 363, 364, 296, 375, 535, 676, 677, 678, 678 INTEGER 43 Integration Strategy 459, 460 Integrity Constraints 505 Integrity Rules 45 Intent Lock 542 Interference 538, 564 internal schema 13 Interoperability 655, 658 Inter-related 2 Interrelated 2, 742 Intersection operators 61 INTERSECT Query 110 ISA 141 Isolated 536 Isolation Levels 556, 557, 564 Iteration Statements 398 J Join 55, 56, 57, 58, 59, 60, 61, 89, 90, 102, 105, 106, 107, 108, 271, 280, 302, 303, 310, 320, 691 Joining Tables 89 Join Operator 55, 58 Join Operator Style 105, 106, 112 K Knowledge Management 497, 498 L Language Style 392 Large Object Architecture 701 leaf 328, 331, 335, 347 Left hand side 221, 222, 226, 227, 229, 231 LEFT JOIN 302, 303, 304, 306, 310, 338, 350, 370 LEVEL pseudo column 328, 330, 338, 340, 341, 347 LIKE operator 86 Linking Columns 368 Local Mapping Transparency 677, 678 Location transparency 675, 676, 677 Locking granularity 541, 542 Locks 541, 544, 557 Logical database design 29, 38 Logical Expressions 88 Logical record 258 Loosely integrated 686 Lost Update 538, 539, 558 M Maintenance Phase 25 Mandatory Access Control 503 Materialized Views 637, 640, 641 Message-oriented middleware 658 Microsoft DGP Framework 514, 515, 516 Microsoft Security Domains 515 Middleware , 11, 22, 496, 23, 658, 395, 396, 661, 585, 35, 403, 410, 702, 705 Minimal Determinant 222 Mixing AND and OR 89 M-N relationship 50, 137, 138, 140, 143, 149, 155, 182, 184, 193, 196, 234, 237, 439, 452, 455, 461 M-N relationship rule 182, 184 Modification anomaly 219, 239 MOLAP 642, 643, 646 Multidimensional OLAP 642 Multiple Candidate Keys 231 Multiple Joins 107 Multiple Row Insert 111 Multiple-Table Read-Only Query 363 Multiple-Table Updatable Views 362 Multiple tier 660 Multiple-Tier Architecture 661 Multivalued Dependencies 234 Multiway Tree 260 Mutating Table Errors 435 MVD 234, 235, 236, 239, 240 N Narrative Problem Analysis 164 Natural Join 55, 56 Nested Queries 307, 313, 316, 322, 348 Nested Tables 720 Node Splitting 262 Non-clustered index 293 Non-procedural access 4, 6, 7, 8, 19 Nonprocedural Access 6 Nonprocedural Database Language 6, 745 Non strict dimension-fact relationship 595, 596, 608 Non-volatile 577 Normal Forms 223, 224, 236 Normalization 479 Normalization Objective 238 NoSQL 11, 12, 20, 21, 731, 732 NOT EXISTS operator 313, 314, 315, 316, 338, 339 NOT NULL 47, 48, 49, 71, 72, 73 Nullify 51 Null value 45, 88 O Object Database Architectures 705 Object Database Management 523, 693, 694, 696, 700, 704 Object database middleware 702, 723 Object-Oriented 695, 704, 705 Object-Oriented DBMS 704 Object-Relational 703, 704 Object Relational Database System 703, 704 Object Views 719 ODMG 395, 704, 705 OLAP 577, 642 ON DELETE CASCADE. For other parts of the database, other characteristics may be more important. In general, what is the state of conformance among major DBMS vendors for the SQL:2011 standard? Microsoft SQL Server uses slightly different syntax and only supports the ALWAYS option unless a SET IDENTITY statement is also used. Chapter 8 describes query optimization, the process of converting a conceptual level query into an internal level representation. Further, change data can affect fact tables and/or dimension tables. What tasks are performed by the Oracle SQL Access Advisor? Figure 16.9 shows an ERD star schema for the sales example presented in Section 16.2. This ERD consists of four dimension entity types, Item, Customer, Store, and TimeDim, along with one (transaction) fact entity type called Sales. Certain INSERT and Update statements do not work with substituted types. The second query block retrieves the USA store sales in 2010. Numerous examples were shown to demonstrate conditions on different data types, complex logical expressions, multiple table joins, summarization of tables with GROUP BY and HAVING, sorting of tables, self joins, and the traditional set operators. 14.3.3 Selection and Evaluation of Database

query block retrieves the USA store sales in 2010. Numerous examples were shown to demonstrate conditions on different data types, complex logical expressions, multiple table joins, summarization of tables with GROUP BY and HAVING, sorting of tables, self joins, and the traditional set operators. 14.3.3 Selection and Evaluation of Database Management Systems Selection and evaluation of a DBMS can be a very important task for an organization. The word schema as applied to databases means database description. To understand these rules, you can apply them to some of the ERDs used in Chapter 5. In the previously referenced 2011 report, the McKinsey Global Institute provides a number of startling sources of potential value for big data: \$300 billion to the US health care industry resulting in 8 percent reduced costs, €250 billion to the European Union's public sector, \$600 billion annual consumer surplus from using personal location data globally, and 60 percent increase in operating margins of retailers. Convert the ERD in Figure 7.P3 into tables and perform further normalization as needed. The next three subsections depict tools (Aqua Data Studio, Oracle SQL Developer, and Microsoft Visio Professional) with these types of restrictions 5.5.2 ERD Notation in Aqua Data Studio The Aqua Data Studio ([www.aquafold.com](http://www.aquafold.com)) supports a variety of DBMSs through query and DBA tools along with data modeling support. With dynamic sampling, Oracle samples tables involved in a query during the compilation process instead of using prebuilt statistics. Selecting appropriate constraint levels may require compromise to balance the needs of different groups. Why would an Oracle trigger to maintain the Applied.CumPrincipal and Applied.CumInterest columns involve mutating table considerations? Extracts the matching rows (the join part) of two tables and the unmatched rows from one or both tables. Figure 5.P3: ERD for Problem 20 21. The resources that are consumed by database processing are physical record transfers, central processing unit (CPU) operations, main memory, and disk space. To determine the scope of the database, you will need to eliminate irrelevant details and add missing details. To provide understanding about the complexity of large collections of triggers, you learned about trigger execution procedures specifying the order of execution among various kinds of triggers, integrity constraints, and SQL statements. Is BCNF a stricter normal form than 3NF? Third generation database technology was largely commercialized during the 1980s. The implementation may involve diverse hardware, software, and people. • XML/SQL duality allows the same data to be manipulated as tables and XML documents. In Visio Professional, a discriminating attribute is an alternative to a disjointness constraint as long as the attribute does not allow null values. Finally, you will learn about problems involving hierarchically structured data and SQL extensions (both standard and proprietary) to formulate queries. Even if conflicts are rare, optimistic approaches can TRANSACTION MANAGEMENT - CHAPTER 15 have more variability because the penalty for conflicts is larger in optimistic approaches. The data types in a programming language may not correspond exactly to the standard SQL data types. Design a time dimension table and one or more relationships to the fact table in problem 10. Identify the finest level grain of the fact table to support automobile claim analysis. However, organizations may have difficulty justifying significant new data warehouse investments as benefits are sometimes difficult to quantify. To distinguish the level of subordinates, include a computed column with the superior level (1 or 2). The lower half of a statement lists the status of each loan. The combination of every column in a table is always a superkey because rows in a table must be unique. Violations of summarizability conditions (non summarizability) can also restrict the ability to use optimizations that improve query performance. However, concurrent users cannot be permitted to interfere with each other. DEVELOPING DATA MODELS FOR BUSINESS DATABASES - CHAPTER 6 Data Modeling Problems 1. DEVELOPING DATA MODELS FOR BUSINESS DATABASES - CHAPTER 6 Figure 6.P2: Product Explosion Diagram 201 202 CHAPTER 6 - DEVELOPING DATA MODELS FOR BUSINESS DATABASES Table 6-P1: Sample Assembly Instructions for the Wheelbarrow Step 1 2 3 4 • Instructions Assembly requires a few hand tools, screw driver, box, or open wrench to fit the nuts. Transformations and data quality checks are performed by a dedicated ETL engine before loading transformed data into target data warehouse tables. Explain the differences in encapsulation for user-defined types versus typed tables in

2 3 4 • Instructions Assembly requires a few hand tools, screw driver, box, or open wrench to fit the nuts. Transformations and data quality checks are performed by a dedicated ETL engine before loading transformed data into target data warehouse tables. Explain the differences in encapsulation for user-defined types versus typed tables in SQL:2011. If the order does not have a related employee (a Web order), the commission is zero. 2.2 Goals of Database Development Broadly, the goal of database development is to create a database that provides an important resource for an organization. Since relational DBMSs provide the underlying storage and retrieval capabilities for enterprise data warehouses, understanding relational DBMS features for data warehouses is an essential part of a student's background. Why is index selection difficult? What are the components of a bitmap index record? List the customer number, the name (first and last), and the balance of customers who reside in Colorado (CustState is CO). The SentTo relationship is redundant. Shared Nothing (SN) Architecture: an architecture for parallel database processing in which each processor has its own memory and disks. Lock requests: IX lock on database DB1, IS lock on database DB1, IX lock on table T1, IS lock on Table T1, SIX lock on block B100 of table T1, S lock on row R1 of B100, X lock on row R2 of B100. Knowledge of these operators will help you formulate more difficult queries. The interval can be expressed as a time (such as five minutes) or as a size parameter such as the number of committed transactions, the number of log pages, or the number of database pages. List the total amount of all orders by month in 2013. A good database design avoids modification anomalies by eliminating excessive redundancies. Transform the M-N relationship from problem 26 into an associative entity type and identifying relationships. Incremental integration begins with the loan origination form because it triggers involvement of Student Loan Limited with a loan. Solid state storage can be used in place of hard drives for moderate-size databases. Rule 3: A column with almost unique values may be a good choice for a nonclustering index if it is used in equality conditions. Note that the FDs Email → StdCity, StdClass should not be added to the list because these FDs can be transitively derived from the other FDs. As a result of step 3, another group of FDs is added. Example 9.28 can be formulated with the same technique as shown in Section 9.3.2. First, join the Faculty and Offering tables, select rows matching the WHERE conditions, and group the result by faculty name (first and last). For the multidimensional data model, this chapter presented the terminology associated with data cubes and the operators to manipulate data cubes. You may assume that the DBMS cannot lock finer than a database page. The expression in the SELECT clause increases the salary by 10 percent. Cooperative change data involves notification from the source system about changes. An optional relationship means that entities can be stored without participation in the relationship. If you determine that the two sets of fields are homonyms (an order may be billed to one address and shipped to another), there are a number of data modeling alternatives as listed below. Student(StdNo, StdCity, StdClass) Offering(OfferNo, OffTerm, OffYear, CourseNo) Course(CourseNo, CrsDesc) Enrollment(StdNo, OfferNo, EnrGrade) After defining the tables, you should add referential integrity constraints to connect the tables. Thus, the result of a one-sided outer join depends on the direction (RIGHT or LEFT) and the position of the table names. List the customer number, customer name (first and last), the sum of the quantity of products ordered, and the total order amount (sum of the product price times the quantity) for orders placed in January 2008. A process can provide input data used by other processes and use the output data of other processes. How is a Type I nested query like a procedure in a program? This requirement involves a difference operation. The big patient table contains a

total order amount (sum of the product price times the quantity) for orders placed in January 2008. A process can provide input data used by other processes and use the output data of other processes. How is a Type I nested query like a procedure in a program? This requirement involves a difference operation. The big patient table contains a combined primary key consisting of the combination of VisitNo and ProvNo (provider number). Incomplete parts of a specification are common for relationships as complete specification involves two sets of cardinalities. Even though the rules are simple, you should still check your ERDs for compliance as it is easy to overlook a violation in a moderate-size ERD. The MDA provides an open specification that supports the formal modeling of all aspects of the software life cycle including business processes, software architectures, data warehousing, metadata repositories, tool integration and even the software development process itself. The data or physical records on the file are organized to support efficient processing. 8.1 What are the possible transaction boundaries for the Patient Billing Form? The growth in data comes from a variety of sources such as sensors in smart phones, energy meters, and automobiles, interaction of individuals in social media websites, radio frequency identification tags in retail, and digitized media content in medicine, entertainment, and security. The primary objective in managing the refresh process is to determine the refresh frequency for each data source. Does the output involve individual rows or groups of rows? Join Algorithm: an algorithm to implement the join operator. Fact tables are usually normalized while dimension tables are often not in third normal form. In spiral development methodologies, the life cycle phases are performed for subsets of a system, progressively producing a larger system until the complete system emerges. Sometimes it is useful to summarize frequencies in more detail. Completeness/consistency constraints can involve maintenance of the same time period in change data or inclusion of change data from each data source for completeness. Likewise, transaction B must wait to obtain an exclusive lock on the row containing electronic good 1. For each movie, a listing may include some or all of these attributes: a title, a release year, an evaluative rating, a content rating, a channel abbreviation, a list of days of the week/time combinations, a list of major actors, and a brief description. Are the reversed transformations less frequently used than the normal transformations? Redraw the timeline showing the locks imposed by the least restrictive isolation level. Using Oracle (either 11.2g or 12c), update the customer reference column of the Trade object from problem 44 to the John Smith Customer object. The backslash only has the escape meaning before a metacharacter. After working independently, the teams can perform a parallel integration to combine their work. The software supports checking accounts, credit cards, and two kinds of investments (mutual funds and stocks). In the UPDATE statement, you should not use an order number or customer number constant. This join operator style can be used to combine any number of tables. In the original trigger in Example 11.36, inserting the same row in the other child (GradStudent2) using the AllGradStudent view will fail because a row already exists in the parent table (Student2). Recovery from a device failure is simple but can be timeconsuming, as listed below:

- The database is restored from the most recent backup.

Example 19.39: Selecting the Number of Rows with a WHERE Condition using the existsNode() Function; existsNode() returns 1 if the node is found in the XPath expression. See also Schema, Internal Schema, External View, and Three Schema Architecture. The classic application involves identification of duplicate customers in lists from different firms. For the Location entity type, add attributes LocNo (primary key), LocBuilding, LocRoomNo, and LocCapacity. Because the TimeYear and TimeMonth columns are from the same dimension hierarchy, a full cube usually is not warranted. An analyst/programmer may create and use external views to develop forms, reports, and other parts of an information system. When an object receives a message, it looks for an implementation in its own class. OLAP (Online Analytical Processing): general name of technology to support multidimensional databases.

Patient(PatSSN, PatName, PatCity, PatAge) Doctor(DocNo, DocName, DocSpecialty) Bill(BillNo, PatSSN, BillDate, AdmitDate, DischargeDate) Charge(ChgNo, BillNo, ItemNo, ChgDate, ChgQty, DocNo) Item(Itemno, ItemDesc, ItemUnit, ItemRate, ItemQOH)

- The main form is used to insert a record into the Bill table.

Row size = 100 bytes Number of rows = 100,000 Primary key size = 6 bytes Physical record size = 4,096 bytes Pointer size = 4 bytes Floor(X) is the largest integer less than or equal to X.

- The selectivity estimate of the condition, HighestDegree = 'HS Graduate', is 0.30. Therefore, a DBA needs a thorough knowledge of DBMSs to perform the process. For index selection, this chapter described trade-offs between retrieval and update applications and presented rules for selecting indexes.

Checkpoint: the act of writing a checkpoint record to the log and writing log and some database buffers to disk. For security reasons, computers in an intranet are usually not accessible from computers on

process. For index selection, this chapter described trade-offs between retrieval and update applications and presented rules for selecting indexes. Checkpoint: the act of writing a checkpoint record to the log and writing log and some database buffers to disk. For security reasons, computers in an intranet are usually not accessible from computers on the Internet. Use the view modification process without additional simplification. Implicit PL/SQL Cursor: a cursor that is neither explicitly declared nor explicitly opened. Parametric User: someone who uses a database by requesting existing forms or reports using parameters, input values that change from usage to usage. Deadlock: a problem of mutual waiting that can occur when using locks. As a response to the potential performance improvements, many DBMSs provide parallel processing capabilities. Package: a PL/SQL unit of modularity. A balanced tree ensures that all leaf nodes can be retrieved with the same access cost. Insert yourself as a new row in the Customer table. Why are the restrict and the project operators widely used? Table 14-11 lists some of the most important catalog tables of Oracle. Because public access shows do not occupy all time slots and are available on one channel only, there is a list of time slots for each day, not a grid as for a complete television guide. Modify your table design in problem 11 if the shipping address (ShipAddr) column determines customer number (CustNo). Include the purchase date and the total purchase cost in the result. Typically, a physical record contains multiple logical records. What are the responsibilities for a DBA for managing dependencies? Typically one payment is made per sale although multiple payments are sometimes made if a customer provides cash for part of the sale. Even if you use a CASE tool, understanding the conversion rules provides insight into the differences between the Entity Relationship Model and the Relational Model. XQuery: a query language designed by the W3C for XML documents. The immediate update approach begins in the rollback phase. Another possibility is that logical records from more than one table are stored in the same physical record. For small organizations, a two-tier data warehouse architecture is appropriate. List all columns of the Product table for products costing more than \$50. Table 14-12 shows the initial level of detail for the data, process, and organization models. All keys reside in the leaf nodes even if a key appears in the index set. The currency symbols are not stored in the database. Also known as a unary, reflexive, or recursive relationship. In Figure 6.33, most employees will not manage offices. Duration should not compromise constraint checking. However, you often need to perform the reverse process (1NF tables to unnormalized tables) for report generation and document representation. Table 14-3: Data Unit Sizes for Big Data Data Unit Terabyte (TB) 1,024 (1,000) GB Petabyte (PB) 1,024 (1,000) EB Exabyte (EB) 1,024 (1,000) PB Zettabyte (ZB) 1,024 (1,000) EB Yottabyte (YB) 1,024 (1,000) ZB Big Data Example Typical hard drive size on a personal computer in 2010 Teradata Database 12 has a capacity of 50 petabytes of compressed data. What are responsibilities of database administrators for managing data warehouses? Explain a situation when a full outer join is useful. The process supports the selection and evaluation process by allowing a systematic assignment of weights to requirements and scores to features of candidate DBMSs. Table 14-18: Interpretation of Rating Values for Pairwise Comparisons Ranking Value of Aij 1 3 5 7 9 Meaning Requirements i and j are equally important. Information Resource Dictionary (IRD): a database of metadata that describes the entire information systems life cycle. The database also tracks vehicle characteristics such as make, model, year, mileage, exterior and interior colors, transmission type (automatic or manual), and number of cylinders (4 or 6). You should note that the primary key of the Student and the Faculty entity types is PerNo, an attribute inherited from the UnivPerson entity type. 66. For the database in question (1), describe how functional users may interact with the database. The model consists of six stages (prenatal, infant, child, teenager, adult, and sage) in which business value increases as organizations progress to higher stages. As you increase your understanding of SQL, this conversion will become easy for most problems. In the ExpenseCategory entity type, CatDesc is unique. A transitive dependency is a functional dependency derived by the law of transitivity. The problem statement includes the objectives, constraints, and scope of the system. Example 11.13: Procedure to Insert a Row into the Registration Table along with Code to Test the Procedure CREATE OR REPLACE PROCEDURE pr\_InsertRegistration (aRegNo IN Registration.RegNo%TYPE, aStdNo IN Registration.StdNo%TYPE, aRegStatus IN Registration.RegStatus%TYPE, aRegDate IN Registration.RegDate%TYPE, aRegTerm IN Registration.RegTerm%TYPE, aRegYear IN Registration.RegYear%TYPE) IS -- Create a new registration 401 402 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS BEGIN INSERT INTO Registration (RegNo, StdNo, RegStatus, RegDate, RegTerm, RegYear) VALUES (aRegNo, aStdNo, aRegStatus, aRegDate, aRegTerm, aRegYear); dbms\_output.put\_line('Row added to Registration table'); END; / -- Testing code SET SERVEROUTPUT ON; -- Number of rows before the procedure execution SELECT COUNT(\*) FROM Registration; BEGIN pr\_InsertRegistration (1275,'901-23-4567','F',To\_Date('27-Feb-2013'),'Spring',2013); END; / -- Number of rows after the procedure execution SELECT COUNT(\*) FROM Registration; -- Delete the inserted row using the ROLLBACK statement ROLLBACK; To enable reuse of pr\_InsertRegistration by other procedures, you should replace the output display with an output parameter indicating the success or failure of the insertion. 227 228 CHAPTER 7 - NORMALIZATION OF RELATIONAL TABLES • • 3NF: UnivTable4 is in 3NF because the only nonkey column (EnrGrade) depends on each candidate key (not just part of a candidate key). Example 9.21: Using a Nested Query in the FROM Clause List the course number, the course description, the number of offerings, and the average enrollment across offerings. Try to reason about the advantages and disadvantages about using this level as the default isolation level. Chapter 6 emphasizes the problem-solving skills of generating alternative designs, mapping a problem statement to an entity relationship diagram, and justifying design decisions. Typically, the join condition specifies that two rows have an identical value in one or more columns. Change Data: data from a source system that provides the basis to update a data warehouse. If any of the binary relationships can be derived from the other two, there is a redundancy. The purchased vehicles are transported to the dealership and inspected for mechanical problems. The first part of a dimension declaration involves the specification of levels. A typical checkpoint interval might be 10 minutes for large transaction volumes. The meters associated







web application. SELECT \* FROM Club WHERE CBudget ASST. What additional information would you need to decide on the appropriate representation? By emphasizing the decision-making potential of integrated information systems, senior management will be motivated to support the planning process. A snapshot table provides a periodic view of an asset level. In contrast, business intelligence processing helps management provide medium-term and long-term direction for an organization. This problem involves relationships among bookings, vehicles, and customers for auto maintenance. Modify the ERD in Figure 13.15 to reflect a change in the relationship between an activity report and associated loans of a student. Conflicts due to different uses of fields and timing (orders precede invoices) are resolved sooner in the incremental approach. Because of the established user bases, these interfaces probably will continue to be more widely used than the SQL:2011 CLS:SQL:2011 specifies the underscore character \_ to match any single character. For example, you should assign a weight that represents the importance of conceptual data definition as compared to nonprocedural retrieval. The number of joins orders is the dominant element in determining the number of access plans. The height of a Btree is important because it determines the number of physical record accesses for searching. For example, you should assign a weight that represents the importance of retrieving students who belong to a subset of the clubs rather than all of the clubs. Dividing a large problem allows smaller problems to be independently solved. Recursive execution means that a procedure calls itself. 209 210 CHAPTER 6 - DEVELOPING DATA MODELS FOR BUSINESS DATABASES • For users, the database records the unique user identifier, unique primary address, first name, postal code, country, and age group. Hash files transform a key value into an address to provide fast access. Reliability is an important issue because the mean time between failures (a measure of disk reliability) decreases as the number of disk drives increases. When a foreign key is not part of a primary key, other rules must be permitted. Most DBMSs have other types of locks to improve efficiency and allow for more concurrent access. Customer data integration is a generalization of entity matching for data warehouses. The database should track basic client information if any client identifier, client name, client insurance info (if any), client address, client date of birth, and client sex. Most universities check these constraints at a later point before the new academic year begins. The Snapshot relationship connects the type of the party node (voicemail) with an entity type node (child node). • Client and Faculty tables { } represent choice elements. Chapter 9 provides more information about the *N* operator. The *N* operator is used to denote the cardinality of the product of the values of a referenced row. 123.3. CACRUSER COUNT Function: COUNT function counts the total number of rows in a table. COUNT function can be used to count the number of rows in a table. An entry type has a direct relationship with the student of the table. Table 3-22 Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WELLS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WELLIS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 WILLIAMS SEATTLE WA ACCT R 3.00 3.40 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR 2.70 234-56-7890 WILLIAMS SEATTLE WA IS FR StdCpa 3.00 124-56-7890 KENDALL TACOMA WA ACCT J.R 3.50 3.24-56-7890 STUDENT1 UNION Student1 StdNo StdLastNm StdCity StdSt Major StdClass CdpaL23-45-6789 WILLIAMS SEATTLE WA IS FR 3.00 124-56-7890 NORBERT BOTHELL WA FIN JR





incomplete dimension fact relationship problem including the schema pattern for the problem. The pointers from the sequence set nodes to the rows cross many times, indicating that the PHYSICAL DATABASE DESIGN - CHAPTER 8 index order is different from the row order. For example, the user may want to see the state name in addition to the state code. For example, a new "non food, non beverage" category can be added to the parent level to relate to unassociated child members such as napkin. A formal form is a rule about allowable dependencies. Explain how the Applied relationship in Figure 13.15 is converted to Figure 13.16. DBMSs ensure that simultaneous users do not interfere with each other and that failures do not cause lost work. List the order number, order date, and shipping name (OrdName) of orders sent to addresses in Denver or Englewood. Example 11.3: PL/SQL Assignment Examples It is assumed that variables used in the examples have been previously declared. Your solution should support an unlimited number of prices and change dates. After time T2, both transactions have stored the value of 10 for LR in local buffers as a result of the read operations. The nouns may appear as subjects or objects in sentences. Query binding is the process of associating a query with an access plan. For example, the collapse operator applied to the Division-Store relationship in Figure 16.11 combines the Division and Store entity types eliminating the snowflake design. Sequential files only can be flat structures. Data governance usually involves a data governance organization, processes used by the organization to determine policies, standards, and rules, and controls and technology to support to support data governance activities. Like a planning professional, a DBMS performs the detailed planning process to answer the complex problems, this chapter explained the subtle effects of null values to provide a deeper understanding of query results 337 338 a chapter 9 LISTING PROGRAMMING FOR WITH SQL slot. Because generalization hierarchies are a specialized but useful feature, it is important to provide some level of support. In addition to more complex matching problems, this chapter explained the subtle effects of null values to provide a deeper understanding of query results 337 338 a chapter 9 LISTING PROGRAMMING FOR WITH SQL slot. Because generalization hierarchies are a specialized but useful feature, it is important to provide some level of support. In these examples, self-referencing relationships are an important part of the database. The Timesheet Form allows an employee to record hours worked on various programs during a time period. The data dictionary contains data descriptors called metadata that define the source, the use, the value, and the meaning of data. What processing environments also involve physical database design decisions? 2.1.2 Calculate the number of physical records necessary for a sequential file. Immediate Update Approach: database updates are written to disk when they occur but after the corresponding log update. The query optimization component uses cost formulas to evaluate access plans. The minimum cardinality indicates that a meter must always be associated with a customer. Identify important privileges in an enterprise DBMS for data warehouses and database statistics. \* For movies, the database should record the unique movie identifier, unique title, genre, list of noteworthy actors, director, format, studio, duration, date released to theaters, and list of subtitle languages. 3 When columns have identical names in two tables, it is customary to precede the column name with the table name and a period as Student.StdNo and Enrollment.StdNo. THE RELATIONAL DATA MODEL - CHAPTER 3 Table 3-5: Alternative Terminology for Relational Databases Table-Oriented Table Row Column Set-Oriented Relation Tuple Atttribute Record-Oriented Record type, file Record Field 3.2 Integrity Rules In the previous section, you learned that a relational database consists of a collection of interrelated tables. For the sample Order Summary Report, write a SELECT statement to produce the data for the detail lines. What is a state-level interface? At the end of 2012, a Gartner report estimated the data integration market size at \$4 billion in 2013 with annual growth rate of 10.3 percent to grow to \$6 billion in 2017. If access was restricted to only one user at a time, little work would be accomplished and most users would take their business elsewhere. In particular, Oracle supports the XML traversal operators existsNode(), extractValue(), updateXML(), and XMLSequence() in the SQL/XML standard. Should a transaction design always eliminate user interaction? For the second question, most tables are combined by a join operation. In step 11, the roll-back phase ends because the START RECORD for the last transaction on the uncommitted list has been encountered. Figure 13.10: Structure of the Disclosure Letter F13.11: ERD after Adding the Disclosure Letter DATABASE DEVELOPMENT FOR STUDENT LOAN LIMITED - CHAPTER 13 Table 13-2: Assumptions for the ERD in Figure 13.11 Annotation Number 1 2 3 Explanation The relationship between DiscLetter and Loan allows multiple letters per loan. Enterprise Data Model (EDM): a conceptual data model of an organization. When combining joins and grouping, what conceptually occurs first, join operations or grouping? Analyze the ERD from problem 36 for cycles among entity types. In general, when a choice exists between two ERDs, you should choose the simpler design especially in the initial stages of the design process. See also snowflake schema, star schema, fact table, and dimension table. \* The Description field in the subform describes a row in the Entity table rather than the Category table. However, these improvements only can be obtained through careful design. The difference operation can be implemented by selecting a faculty teaching winter 2013 in the outer query if the same faculty does not teach an offering in a different term in the nested query. Database Partitioning Feature (DPF): an IBM technology for parallel database processing. You should group together fields that are associated with the primary keys found in step 2. One-to-Many (1-M) Relationship: in the Entity Relationship Model, a relationship in which the maximum cardinality is 1 in one direction and M in the other direction. If a key cannot be borrowed, nodes must be concatenated, as shown in Figure 8.15(d). Before presenting the trigger example, some additional tables and views are needed. 543-37-9593 To add Figure 8.18 inserting a New Logical Record into an Unordered Sequential File. The primary advantage of unordered sequential files is fast insertion. Each detail line contains a major number, a water consumption level, and an amount. Oracle provides adaptive access plans to deal with parameterized queries. To depict this SELECT statement, format and structure the listing of statements, this chapter shows numerous examples. Data Programming language: a procedural language with an interface to one or more DBMSs. The interface allows a program to combine procedural statements with nonprocedural database access. In this example from the previous paragraph, extended statements could be collected on the combination of the EmpPosition and Salary columns. DATA AND DATABASE ADMINISTRATION - CHAPTER 14 CREATE TABLE Student (StdNo CHAR(11) NOT NULL, StdName VARCHAR(50) CONSTRAINT StuNameRequired NOT NULL, StdLastname VARCHAR(50) CONSTRAINT StuLastnameRequired NOT NULL, StdCity CHAR(6) CONSTRAINT StuCityRequired NOT NULL, StdState CHAR(2) CONSTRAINT StuStateRequired NOT NULL, StdMajor CHAR(6), StdClass CHAR(16), StdGrade DECIMAL(3,2), CONSTRAINT PKStudent PRIMARY KEY (StdSSN), CONSTRAINT ValGpa CHECK (StdGpa IN ('FR', 'SC') OR StdMajor IS NOT NULL) Although CHECK constraints are widely supported, most DBMSs limit the options inside CHECK constraints. This single-table design is not as extensible as it may seem. If Student.Limit was added to update zip codes independently of students, a separate table should be added. Figure 14.11: Microsoft Risk Gap Analysis Process (Adapted from Salido and Voon, 2010, Pg 10). The gap is the organization's relative progress in data governance. Microsoft provides the risk gap analysis maturity model (CMMI) which is the role-based table that details the database application development. The growing column is the progress of the implementation. The current column is the current status of the role. What happens in the maturity assessment process is addressed by the conceptual evaluation questions? Figure 13.13: B-Sort Node Containing Keys and Pointers. Another possibility is to add the letter B to the beginning of the Three Professor Rank table. This helps to change the key used for identifying rows in the table. How many transactions per minute are reported for various DBMSs? In addition, a student may choose income-comparison after separating from school. This chapter discusses background so that this will become proficient in designing databases and developing applications for relational databases in later chapters. If there are additional SQL statements that use these columns in conditions, nonclustered indexes should be considered. Example 9.1 (Access): One-Sided Outer Join using LEFT JOIN For offering beginning with IS in the associated course numbers, retrieve the offer number, the course number, the faculty number, and the faculty name. Appendix 3-B: SQL 2011 Syntax Summary This appendix provides a convenient summary of the SQL 2011 syntax for the CREATE TABLE statement along with several related statements. A transaction boundary can also be shortened by removing user interaction. A desktop DBMS supports databases for small workgroups and small businesses. Create testing scripts for the function in problem 12 and the procedure in problem 13. SELECT OfferId,BldgNo,OrdNo,OrdDate,EmployeeEmpNo,FacFirstNm,EmpLastNm,CustFirstNm,CustLastNm,OrdLineQty,ProductProdNo FROM ((  
Customer ON Customer.CustNo=Order!BldgNo)  
INNER JOIN Ordline ON Order!BldgNo=Ordline!BldgNo  
INNER JOIN Product ON Ordline!ProdNo=Product!ProdNo  
32. Sequential file format well on sequential search but poorly on search. Variable Declaration and Assignment Statement A variable declaration contains a variable name (a user identifier), a data type, and an optional default value. Each individual requirement should be classified as essential, desirable, or optional to the requirement group. Because deadlock detection can involve significant computation time, deadlock detection is only performed at periodic intervals or triggered by waiting transactions. T4 and TS transactions (not yet committed) do not require undo operations because no database changes are written to disk until after a transaction commits. What changes to an ERD are necessary when expanding an attribute? What is the motivation for the entity integrity rule? An integration strategy (Figure 12.22) specifies a mix of incremental and parallel approaches to integrate a set of views. The rows in the Table 17-6 represent predictions, and the columns represent actuals of matching two records for duplication. For example, the simplified university database does not contain data about course prerequisites and classroom locations and locations. Fourth Normal Form (4NF) Fourth normal form (4NF) prohibits redundancies caused by multivalued dependencies. Other columns such as StdCity and StdClass are nonkey columns. SELECT CrsDesc,CrsCount(\*) AS OfferCount FROM Course\_Offer WHERE CourseName LIKE 'IS%' GROUP BY CrsDesc,CrsDesc,OfferCount FUNDAMENTALS OF BUSINESS PROGRAMMING 6 FUNDAMENTALS OF DATABASE MANAGEMENT 2 SYSTEMS ANALYSIS 2 Example 4.24 (Oracle): Combining Grouping and Joins Summarize the number of course offerings by course description. 2.4.1 Diagramming Diagramming is the most important and widely used function in CASE tools. 15 16 CHAPTER 1 - INTRODUCTION TO DATABASE MANAGEMENT Tokyo Client Server Database Client Client Client Database Database Figure 1.15: Distributed Database with Three Site Distributed Database: a database in which parts are located at different network sites. This section describes the storage level as well as the objectives, inputs, and outputs of physical database design. • The selectivity estimate of the condition. WageHome > 60000 is 0.30. Review the ERD from problem 15 by adding an offer entity type. Why is it necessary to learn the catalog tables of a specific DBMS? The prohibition against unneeded columns for determinants is the same as the prohibition against unneeded columns in candidate keys. Otherwise, some enrollments can be meaningless, possibly resulting in students denied enrollment because non-existing students took their places. Why are non-minimal superkeys typically ignored? \* For each event request, the database records the unique event number, the date held, the date requested, the date authorized, the status, an estimated cost, the estimated audience, the facility number (required), and the customer number (required). Union Compatibility Compatibility is a new concept for the table operators as compared to the traditional set operators. The SQL Access Advisor is often used in tandem with the SQL Tuning Advisor. How do null values affect aggregate calculations? In addition, a combination of ETL and ELT processing may provide better performance for enterprise warehouses so the demand for both architectures should grow without either architecture dominating. In the third step, risks for each cell of the risk-gap matrix are determined using the security and privacy principle. How is an M-N relationship converted to the Relational Model? For example, the invoice form (Figure 12.9) uses the quantity of each product ordered (from the order form) to determine the quantity to ship. 413 414 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS • Generalization hierarchy simulation. Perform update propagation to maintain generalization hierarchy relationships and enforce generalization hierarchy constraints. • Sample Databases and Examples Two sample databases are used throughout the chapters of Parts 2 and 5 to provide consistency and continuity. The Fly by Night Operation is a newly formed airline aimed at the burgeoning market of clandestine travelers (hijackers, spies, con artists, scoundrels, deadbeats, cheating spouses, politicians, etc.). See also non strict dimension fact relationships DATABASE DEVELOPMENT FOR STUDENT LOAN LIMITED - CHAPTER 13 Table 13-8: Application Characteristics Application Verify Data (for loan origination) Tables Student, Lender, Institution, Guarantor, Loan, Disburse, Line, Insert Row in DiscLetter; retrieves rows from Student and Loan (LoanNo = \$X) DiscLetter LoanNo = \$X Student, Loan, Activity, Insert row in LoanActivity; retrieve Applied, Statement rows from Student (for loan origination) Create disclosure letter Display disclosure letter Create loan activity report Display loan activity report Create statement of account Statement, 1 row inserted in Statement; multiple rows inserted in Applied Statement, Student, Applied, StdNo = \$X AND DateSent = \$Y; Loan Applied rows updated; LoanNo = \$X AND StatementNo = \$Z Applied, Statement, Loan, Applied rows updated; LoanNo = \$X AND StatementNo = \$Y Balance updated in the Loan table Display statement of record Apply payment To make physical database design decisions, the relative importance of applications must be specified. Another example is "students who have taken every course." 9.3.2 Simple Division Problems There are a number of ways to perform division in SQL. As long as the physical record is free space, a collision is no problem. 1-M relationships must be identified in the child-to-parent direction. 381 382 CHAPTER 10 - APPLICATION DEVELOPMENT WITH VIEWS Figure 10.5: Purchase Form 27 • GROUP BY conceptually occurs after WHERE. Using SQL2011, write a SELECT statement to list the securities held by Denver customers. UPDATE Offering SET FacNo = \$X WHERE OfferNo = \$Y 1/000/year End of year 64,000/year \$X is usually very large or small 30,000/term 60,000/term Few rows in result 30,000/term Update at end of reporting form Part of grade reporting form 120,000/term 500/year PHYSICAL DATABASE DESIGN - CHAPTER 8 14. Identify two transactions that you have encountered recently. The total amount of an order is the sum of the quantity times the product price of each product on the order. This section first describes workflows, a broader notion than database transactions. A nonclustering index can improve retrievals by providing fast access to selected records. What is an anchored variable declaration? SELECT Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm HAVING COUNT(\*) = (SELECT COUNT(\*) FROM Offering WHERE OfferNo = 'FAIL' AND OfferYear = '2012 GROUP BY Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm) Example 9.28 is not particularly useful because it is unlikely that any instructor has taught every offering. PHYSICAL DATABASE DESIGN - CHAPTER 8 Table 8-4: Example Application Profiles Application Query Course, Offering, Enrollment Registration Form Enrollment Registration Form Delete Registration Form Enrollment, Delete Registration Form Enrollment, Delete Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Course Retrieval Offering, Faculty Course, Of Retrieval, Enrollment, Faculty Workload Report Insert Insert Frequency 100 per day during the registration period, 50 per day during the drop/add period, 1,000 per day during the registration period, 500 per day during the drop/add period 6,000 per day during the registration period, 1,500 per day during the last week of the academic period; 10 per day otherwise; typical; payoffs for the security and privacy principle. How is an M-N relationship converted to the Relational Model? For example, the invoice form (Figure 12.9) uses the quantity of each product ordered (from the order form) to determine the quantity to ship. 413 414 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS • Generalization hierarchy simulation. Perform update propagation to maintain generalization hierarchy relationships and enforce generalization hierarchy constraints. • Sample Databases and Examples Two sample databases are used throughout the chapters of Parts 2 and 5 to provide consistency and continuity. The Fly by Night Operation is a newly formed airline aimed at the burgeoning market of clandestine travelers (hijackers, spies, con artists, scoundrels, deadbeats, cheating spouses, politicians, etc.). See also non strict dimension fact relationships DATABASE DEVELOPMENT FOR STUDENT LOAN LIMITED - CHAPTER 13 Table 13-8: Application Characteristics Application Verify Data (for loan origination) Tables Student, Lender, Institution, Guarantor, Loan, Disbuse, Line, Insert Row in DiscLetter; retrieves rows from Student and Loan (LoanNo = \$X) DiscLetter LoanNo = \$X Student, Loan, Activity, Insert row in LoanActivity; retrieve Applied, Statement rows from Student (for loan origination) Create disclosure letter Display disclosure letter Create loan activity report Display loan activity report Create statement of account Statement, 1 row inserted in Statement; multiple rows inserted in Applied Statement, Student, Applied, StdNo = \$X AND DateSent = \$Y; Loan Applied rows updated; LoanNo = \$X AND StatementNo = \$Z Applied, Statement, Loan, Applied rows updated; LoanNo = \$X AND StatementNo = \$Y Balance updated in the Loan table Display statement of record Apply payment To make physical database design decisions, the relative importance of applications must be specified. Another example is "students who have taken every course." 9.3.2 Simple Division Problems There are a number of ways to perform division in SQL. As long as the physical record is free space, a collision is no problem. 1-M relationships must be identified in the child-to-parent direction. 381 382 CHAPTER 10 - APPLICATION DEVELOPMENT WITH VIEWS Figure 10.5: Purchase Form 27 • GROUP BY conceptually occurs after WHERE. Using SQL2011, write a SELECT statement to list the securities held by Denver customers. UPDATE Offering SET FacNo = \$X WHERE OfferNo = \$Y 1/000/year End of year 64,000/year \$X is usually very large or small 30,000/term 60,000/term Few rows in result 30,000/term Update at end of reporting form Part of grade reporting form 120,000/term 500/year PHYSICAL DATABASE DESIGN - CHAPTER 8 14. Identify two transactions that you have encountered recently. The total amount of an order is the sum of the quantity times the product price of each product on the order. This section first describes workflows, a broader notion than database transactions. A nonclustering index can improve retrievals by providing fast access to selected records. What is an anchored variable declaration? SELECT Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm HAVING COUNT(\*) = (SELECT COUNT(\*) FROM Offering WHERE OfferNo = 'FAIL' AND OfferYear = '2012 GROUP BY Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm) Example 9.28 is not particularly useful because it is unlikely that any instructor has taught every offering. PHYSICAL DATABASE DESIGN - CHAPTER 8 Table 8-4: Example Application Profiles Application Query Course, Offering, Enrollment Registration Form Enrollment Registration Form Delete Registration Form Enrollment, Delete Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Course Retrieval Offering, Faculty Course, Of Retrieval, Enrollment, Faculty Workload Report Insert Insert Frequency 100 per day during the registration period, 50 per day during the drop/add period, 1,000 per day during the registration period, 500 per day during the drop/add period 6,000 per day during the registration period, 1,500 per day during the last week of the academic period; 10 per day otherwise; typical; payoffs for the security and privacy principle. How is an M-N relationship converted to the Relational Model? For example, the invoice form (Figure 12.9) uses the quantity of each product ordered (from the order form) to determine the quantity to ship. 413 414 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS • Generalization hierarchy simulation. Perform update propagation to maintain generalization hierarchy relationships and enforce generalization hierarchy constraints. • Sample Databases and Examples Two sample databases are used throughout the chapters of Parts 2 and 5 to provide consistency and continuity. The Fly by Night Operation is a newly formed airline aimed at the burgeoning market of clandestine travelers (hijackers, spies, con artists, scoundrels, deadbeats, cheating spouses, politicians, etc.). See also non strict dimension fact relationships DATABASE DEVELOPMENT FOR STUDENT LOAN LIMITED - CHAPTER 13 Table 13-8: Application Characteristics Application Verify Data (for loan origination) Tables Student, Lender, Institution, Guarantor, Loan, Disbuse, Line, Insert Row in DiscLetter; retrieves rows from Student and Loan (LoanNo = \$X) DiscLetter LoanNo = \$X Student, Loan, Activity, Insert row in LoanActivity; retrieve Applied, Statement rows from Student (for loan origination) Create disclosure letter Display disclosure letter Create loan activity report Display loan activity report Create statement of account Statement, 1 row inserted in Statement; multiple rows inserted in Applied Statement, Student, Applied, StdNo = \$X AND DateSent = \$Y; Loan Applied rows updated; LoanNo = \$X AND StatementNo = \$Z Applied, Statement, Loan, Applied rows updated; LoanNo = \$X AND StatementNo = \$Y Balance updated in the Loan table Display statement of record Apply payment To make physical database design decisions, the relative importance of applications must be specified. Another example is "students who have taken every course." 9.3.2 Simple Division Problems There are a number of ways to perform division in SQL. As long as the physical record is free space, a collision is no problem. 1-M relationships must be identified in the child-to-parent direction. 381 382 CHAPTER 10 - APPLICATION DEVELOPMENT WITH VIEWS Figure 10.5: Purchase Form 27 • GROUP BY conceptually occurs after WHERE. Using SQL2011, write a SELECT statement to list the securities held by Denver customers. UPDATE Offering SET FacNo = \$X WHERE OfferNo = \$Y 1/000/year End of year 64,000/year \$X is usually very large or small 30,000/term 60,000/term Few rows in result 30,000/term Update at end of reporting form Part of grade reporting form 120,000/term 500/year PHYSICAL DATABASE DESIGN - CHAPTER 8 14. Identify two transactions that you have encountered recently. The total amount of an order is the sum of the quantity times the product price of each product on the order. This section first describes workflows, a broader notion than database transactions. A nonclustering index can improve retrievals by providing fast access to selected records. What is an anchored variable declaration? SELECT Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm HAVING COUNT(\*) = (SELECT COUNT(\*) FROM Offering WHERE OfferNo = 'FAIL' AND OfferYear = '2012 GROUP BY Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm) Example 9.28 is not particularly useful because it is unlikely that any instructor has taught every offering. PHYSICAL DATABASE DESIGN - CHAPTER 8 Table 8-4: Example Application Profiles Application Query Course, Offering, Enrollment Registration Form Enrollment Registration Form Delete Registration Form Enrollment, Delete Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Course Retrieval Offering, Faculty Course, Of Retrieval, Enrollment, Faculty Workload Report Insert Insert Frequency 100 per day during the registration period, 50 per day during the drop/add period, 1,000 per day during the registration period, 500 per day during the drop/add period 6,000 per day during the registration period, 1,500 per day during the last week of the academic period; 10 per day otherwise; typical; payoffs for the security and privacy principle. How is an M-N relationship converted to the Relational Model? For example, the invoice form (Figure 12.9) uses the quantity of each product ordered (from the order form) to determine the quantity to ship. 413 414 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS • Generalization hierarchy simulation. Perform update propagation to maintain generalization hierarchy relationships and enforce generalization hierarchy constraints. • Sample Databases and Examples Two sample databases are used throughout the chapters of Parts 2 and 5 to provide consistency and continuity. The Fly by Night Operation is a newly formed airline aimed at the burgeoning market of clandestine travelers (hijackers, spies, con artists, scoundrels, deadbeats, cheating spouses, politicians, etc.). See also non strict dimension fact relationships DATABASE DEVELOPMENT FOR STUDENT LOAN LIMITED - CHAPTER 13 Table 13-8: Application Characteristics Application Verify Data (for loan origination) Tables Student, Lender, Institution, Guarantor, Loan, Disbuse, Line, Insert Row in DiscLetter; retrieves rows from Student and Loan (LoanNo = \$X) DiscLetter LoanNo = \$X Student, Loan, Activity, Insert row in LoanActivity; retrieve Applied, Statement rows from Student (for loan origination) Create disclosure letter Display disclosure letter Create loan activity report Display loan activity report Create statement of account Statement, 1 row inserted in Statement; multiple rows inserted in Applied Statement, Student, Applied, StdNo = \$X AND DateSent = \$Y; Loan Applied rows updated; LoanNo = \$X AND StatementNo = \$Z Applied, Statement, Loan, Applied rows updated; LoanNo = \$X AND StatementNo = \$Y Balance updated in the Loan table Display statement of record Apply payment To make physical database design decisions, the relative importance of applications must be specified. Another example is "students who have taken every course." 9.3.2 Simple Division Problems There are a number of ways to perform division in SQL. As long as the physical record is free space, a collision is no problem. 1-M relationships must be identified in the child-to-parent direction. 381 382 CHAPTER 10 - APPLICATION DEVELOPMENT WITH VIEWS Figure 10.5: Purchase Form 27 • GROUP BY conceptually occurs after WHERE. Using SQL2011, write a SELECT statement to list the securities held by Denver customers. UPDATE Offering SET FacNo = \$X WHERE OfferNo = \$Y 1/000/year End of year 64,000/year \$X is usually very large or small 30,000/term 60,000/term Few rows in result 30,000/term Update at end of reporting form Part of grade reporting form 120,000/term 500/year PHYSICAL DATABASE DESIGN - CHAPTER 8 14. Identify two transactions that you have encountered recently. The total amount of an order is the sum of the quantity times the product price of each product on the order. This section first describes workflows, a broader notion than database transactions. A nonclustering index can improve retrievals by providing fast access to selected records. What is an anchored variable declaration? SELECT Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm HAVING COUNT(\*) = (SELECT COUNT(\*) FROM Offering WHERE OfferNo = 'FAIL' AND OfferYear = '2012 GROUP BY Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm) Example 9.28 is not particularly useful because it is unlikely that any instructor has taught every offering. PHYSICAL DATABASE DESIGN - CHAPTER 8 Table 8-4: Example Application Profiles Application Query Course, Offering, Enrollment Registration Form Enrollment Registration Form Delete Registration Form Enrollment, Delete Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Course Retrieval Offering, Faculty Course, Of Retrieval, Enrollment, Faculty Workload Report Insert Insert Frequency 100 per day during the registration period, 50 per day during the drop/add period, 1,000 per day during the registration period, 500 per day during the drop/add period 6,000 per day during the registration period, 1,500 per day during the last week of the academic period; 10 per day otherwise; typical; payoffs for the security and privacy principle. How is an M-N relationship converted to the Relational Model? For example, the invoice form (Figure 12.9) uses the quantity of each product ordered (from the order form) to determine the quantity to ship. 413 414 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS • Generalization hierarchy simulation. Perform update propagation to maintain generalization hierarchy relationships and enforce generalization hierarchy constraints. • Sample Databases and Examples Two sample databases are used throughout the chapters of Parts 2 and 5 to provide consistency and continuity. The Fly by Night Operation is a newly formed airline aimed at the burgeoning market of clandestine travelers (hijackers, spies, con artists, scoundrels, deadbeats, cheating spouses, politicians, etc.). See also non strict dimension fact relationships DATABASE DEVELOPMENT FOR STUDENT LOAN LIMITED - CHAPTER 13 Table 13-8: Application Characteristics Application Verify Data (for loan origination) Tables Student, Lender, Institution, Guarantor, Loan, Disbuse, Line, Insert Row in DiscLetter; retrieves rows from Student and Loan (LoanNo = \$X) DiscLetter LoanNo = \$X Student, Loan, Activity, Insert row in LoanActivity; retrieve Applied, Statement rows from Student (for loan origination) Create disclosure letter Display disclosure letter Create loan activity report Display loan activity report Create statement of account Statement, 1 row inserted in Statement; multiple rows inserted in Applied Statement, Student, Applied, StdNo = \$X AND DateSent = \$Y; Loan Applied rows updated; LoanNo = \$X AND StatementNo = \$Z Applied, Statement, Loan, Applied rows updated; LoanNo = \$X AND StatementNo = \$Y Balance updated in the Loan table Display statement of record Apply payment To make physical database design decisions, the relative importance of applications must be specified. Another example is "students who have taken every course." 9.3.2 Simple Division Problems There are a number of ways to perform division in SQL. As long as the physical record is free space, a collision is no problem. 1-M relationships must be identified in the child-to-parent direction. 381 382 CHAPTER 10 - APPLICATION DEVELOPMENT WITH VIEWS Figure 10.5: Purchase Form 27 • GROUP BY conceptually occurs after WHERE. Using SQL2011, write a SELECT statement to list the securities held by Denver customers. UPDATE Offering SET FacNo = \$X WHERE OfferNo = \$Y 1/000/year End of year 64,000/year \$X is usually very large or small 30,000/term 60,000/term Few rows in result 30,000/term Update at end of reporting form Part of grade reporting form 120,000/term 500/year PHYSICAL DATABASE DESIGN - CHAPTER 8 14. Identify two transactions that you have encountered recently. The total amount of an order is the sum of the quantity times the product price of each product on the order. This section first describes workflows, a broader notion than database transactions. A nonclustering index can improve retrievals by providing fast access to selected records. What is an anchored variable declaration? SELECT Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm HAVING COUNT(\*) = (SELECT COUNT(\*) FROM Offering WHERE OfferNo = 'FAIL' AND OfferYear = '2012 GROUP BY Faculty.FacNo, Faculty.FacFirstNm, Faculty.FacLastNm) Example 9.28 is not particularly useful because it is unlikely that any instructor has taught every offering. PHYSICAL DATABASE DESIGN - CHAPTER 8 Table 8-4: Example Application Profiles Application Query Course, Offering, Enrollment Registration Form Enrollment Registration Form Delete Registration Form Enrollment, Delete Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Student Retrieval Registration Form Enrollment, Course Retrieval Offering, Faculty Course, Of Retrieval, Enrollment, Faculty Workload Report Insert Insert Frequency 100 per day during the registration period, 50 per day during the drop/add period, 1,000 per day during the registration period, 500 per day during the drop/add period 6,000 per day during the registration period, 1,500 per day during the last week of the academic period; 10 per day otherwise; typical; payoffs for the security and privacy principle. How is an M-N relationship converted to the Relational Model? For example, the invoice form (Figure 12.9) uses the quantity of each product ordered (from the order form) to determine the quantity to ship. 413 414 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS • Generalization hierarchy simulation. Perform update propagation to maintain generalization hierarchy relationships and enforce generalization hierarchy constraints. • Sample Databases and Examples Two sample databases are used throughout the chapters of Parts 2 and 5 to provide consistency and continuity. The Fly by Night Operation is a newly formed airline aimed at the burgeoning market of clandestine travelers (hijackers, spies, con artists, scoundrels, deadbeats, cheating spouses, politicians, etc.). See also non strict dimension fact relationships DATABASE DEVELOPMENT FOR STUDENT LOAN LIMITED - CHAPTER 13 Table 13-8: Application Characteristics Application Verify Data (for loan origination) Tables Student, Lender, Institution, Guarantor, Loan, Disbuse, Line, Insert Row in DiscLetter; retrieves rows from Student and Loan (LoanNo = \$X) DiscLetter LoanNo = \$X Student, Loan, Activity, Insert row in LoanActivity; retrieve Applied, Statement rows from Student (for loan origination) Create disclosure letter Display disclosure letter Create loan activity report Display loan activity report Create statement of account Statement, 1 row inserted in Statement; multiple rows inserted in Applied Statement, Student, Applied, StdNo = \$X AND DateSent = \$Y; Loan Applied rows updated; LoanNo = \$X AND StatementNo = \$Z Applied, Statement, Loan, Applied rows updated; LoanNo



T.CrsDesc • Identifying problem statements involving the division operator: the word every or all connecting different parts of a sentence • Using the count method to formulate division problems SELECT StdNo FROM StdClub GROUP BY StdNo HAVING COUNT(\*) = (SELECT COUNT(\*) FROM Club) • Evaluating a simple condition containing a null value in a column expression • Using three-valued logic and truth tables to evaluate compound conditions with null values • Understanding the result of grouping calculations with null values • Recognizing the need to formulate hierarchical queries for tables with hierarchical data using the CONNECT BY PRIOR and START WITH clauses to formulate basic hierarchical queries SELECT FaCno, FaSupervisor, FaCFirstName, FaCLastName, FaChireDate, FaSalary, FaCrank, LEVEL FROM Faculty2 START WITH FaSupervisor IS NULL CONNECT BY PRIOR FaCno = FaSupervisor ORDER BY LEVEL • Applying the proprietary Oracle syntax elements including the LEVEL pseudo column, CONNECT BY ROOT operator, SYS\_CONNECT\_BY\_PATH function, CONNECT BY ISLEAF pseudo column, and SIBLINGS keyword to formulate more complex hierarchical queries • Formulating path exception queries listing violations of monotonicity in path relationships such as subordinates earning more than their direct or indirect supervisors. The Data Warehouse Expansion Project will add data from preschool to career and extend security and accuracy in teacher and student data reporting. Because Oracle has numerous restrictions on conditions in WHEN clauses, the WHEN clause is used infrequently. For the environment, Simple Order form shown in Figure 10.2, answer the five data requirement questions discussed in Section 10.4.3. The form supports manipulation of the heading and the details of orders. As chapter 11 goes into optimizing database middleware, efficiency has become less important. An information system accepts data from its environment, processes data, and produces output for decision making. a) Client-server processing with database server Database Data Base Server INTRODUCTION TO DATABASE MANAGEMENT - CHAPTER 1 b) Client-server processing with middleware, efficiency and database servers Database server Middleware server Figure 1.13: Typical Client-Server Architectures In the last decade, parallel database technology has gained commercial acceptance for large organizations. Add sample rows to Table 7-2 to demonstrate contradictions of the following FIDs. Remember that it takes two rows to contradict an FID. Metadata: data that describe other data including the source, use, value, and meaning of the data. Chapter 1 covers characteristics of data sources, workflow specification of data integration tasks, details of data cleaning tasks, data integration tools, and management of complex refresh processes. The write operation performed by transaction A is not known by transaction B unless transaction B reads the value again. The notification typically occurs at transaction completion or when a trigger fired on a table type is also called NUMERIC in some systems. For example to maintain history of the current row, two attributes (p1, p2) and EmpPrevious are added to the table. The first row is inserted into the table with the value of 1. Some systems have estimated the transaction history of 50% of soft deleted rows. Ensure DBMS supports database triggers that are fired on the beginning of a transaction. What are the advantages of a fuzzy checkpoint as compared to a cache-consistent checkpoint? Rewrite the Part table as a set: (p1, p2, p3, p4, 5, 6). Define a unique constraint for each foreign primary key that was not designated as the primary key of the new table. If you followed the problem directions, your diagram should not have any errors. In addition, all log buffers as well as some database buffers are written to disk. The transaction design typically has the option of making one large transaction containing all SQL statements or dividing the SQL statements into multiple smaller transactions. If the statement executed with the data existing before trigger execution, the new data does not appear. "erwin", "window": Does not match the first search string because "win" does not appear at the beginning of the search string "erwin", "window": Does not match the second search string because "win" does not appear at the end of the search string "123", "abc": "g456": Matches the second and third search strings. - negates the string pattern inside the [ ] matching any non-digit. Convert the ERD shown in Figure 6.C9 into tables. Portability can be important in some environments. • Be cautious about triggers on tables affected by actions on referenced rows. • Determine if new indexes can significantly enhance the performance of a query. Properties of entity types and relationships support conversion to a table design. Because these DBMSs view any kind of data as an object to manage, fourth-generation systems are sometimes called "object-relational." Chapter 19 presents details about object features in DBMSs. In addition to the emphasis on objects, DBMSs have developed new forms of distributed processing. You should be able to recognize schema patterns that provide summarizability as well as patterns involving summarizability problems. Why is batch processing an important motivation for database programming languages? Compare and contrast the software licenses for MySQL and another open source DBMS product. Using the estimate from the uniform value assumption, the optimizer will choose a sequential file instead of a Btree to access the employee table. Drill-Down: a data cube operator that supports navigation from a more general level of a dimension to a more specific level of a dimension. As you will see, this arrangement facilitates the normalization process. If the node is still at least half full, no additional action is necessary as shown in Figure 8.15(b). A major challenge is to make diverse components communicate efficiently. For example, workflow specification can indicate that a student should be denied financial aid unless enrolling for a minimum number of hours by a specified date. A transaction record identifies the teller, account, and branch. The recent movement to incorporate solid state storage changes the limitations on database performance in some applications. Note that some of the refinements shown previously were not used in the revised ERD. In addition to the revisions noted in the previous paragraph, you should be aware of several assumptions made in the design of the Extended Order Entry Database. • The design makes the simplifying assumption that there is only one supplier for each product. Why is transparency important for concurrency control and recovery management? An event model includes events for user actions such as clicking a button, as well as internal events such as before a database record is updated. Higher transaction throughput means lower response times. The result is identical to Example 9.22. For the following conditions and indexes, indicate if the index matches the condition. The semicolon terminates the entire statement including the WITH clause and SELECT statement. 24.1 What would the Oracle optimizer estimate as the selectivity of the joint condition Age AND HighestDegree when only using statistics on individual columns? 6.4.3 Converting Generalization Hierarchies The approach to convert generalization hierarchies mimics the entity relationship notation as much as possible. If you find this organization more intuitive, you should use it. Single Table Form Lab 5. For example, if the city column of a customer row changes, the related sales rows are no longer historically accurate. If the DBMS locks the next available page rather than just the new row, all subform line transactions must obtain an exclusive lock on the next available physical record. When in doubt, you should retain the relationship. The Oracle data modeling tool does not provide relationship names and uses arrows for child to parent relationships. For nonmatching rows, null values are used to complete the column values in the other table. A column having a distinct type can be compared only with another column using the same distinct type. Logged change data usually involves no changes to a source system as logs are readily available for most source systems. For example, information life cycles for operations provide input to life cycles for management decision making. Using the Oracle proprietary notation, write a SELECT statement to retrieve the closure (combinations of employee and supervisor, direct or indirect) starting with the root employees having null values for SupEmpNo. The result should contain EmpLastNames arranged to depict the hierarchical structure using the LPAD function (See Example 9.43). EmpNo, EmpSalary, EmpGrade, and EmpCommRate. The conceptual and external schemas follow the rules of the Entity Relationship Model, a graphical representation that depicts things of interest (entities) and relationships among entities. Both the Customer type and table have no parent. Your last payment is due September 30, 2022. To accommodate both physical record accesses and CPU usage, a weight can be used to combine them into one measure. What is the difference between a primary and a secondary file structure? The join operator style can be somewhat difficult to read for statements with many join operations, but it supports outer join operations as shown in Chapter 9. A shared lock indicates that a user will read but not change the value of a database item. Example 9.32 shows an Access solution using a nested query in the FROM clause. A part has a unique identifier, a name, and a color. For example, a faculty workload constraint ensures that each faculty member teaches between three and nine units each semester. The most important and widely known properties are the ACID properties (atomic, consistent, isolated, and durable) as presented in the following list. It may seem surprising, but IBM was not the first company to commercialize SQL. Resolution of Synonyms and Homonyms: A synonym is a group of words that are spelled differently but have the same meaning. Aggregation Property: indicates allowable summary operations for measures. For more details about both approaches, you should see references listed in this section and at the end of the chapter. Repeat problem 9 using the MINUS keyword. To provide the flexibility of user-defined transactions, DBMSs cannot restrict transactions to only a specified number of reads and writes to a database. Rule 5 applies to an entire generalization hierarchy, not to each entity type in a generalization hierarchy. How do you perform a full outer join in SQL implementations (such as Microsoft Access) that do not support the FULL JOIN keywords? Include the primary keys, foreign keys, and other candidate keys in the final list of tables. Unlike CHECK constraints, assertions are not associated with a specific table. While studying this chapter, you may want to review important concepts from Chapter 10, such as updatable views. For example, in a university database, a user should be able to insert a new offering of the course and a new student enrolled in the course. See also big data. For example, Figure 16.7 shows the result of a dice operation to display sales for the State of Utah for January 1, 2013. Other CASE tools target various phases of database development without supporting other aspects of information systems development. This chapter concludes by briefly presenting additional normal forms and discussing the usefulness and limitations of normalization techniques in the database development process. The difference operator extracts rows that belong to the first table only. Conceptual data modeling is especially people-oriented. BEFORE INSERT OR UPDATE OF OfferNo ON Enrollment FOR EACH ROW DECLARE anOffLimit Offering,OffLimit%TYPE; anOffNumEnrolledd String; anOffNumEnrolledd INTO anOffLimit; IF: EXCEPTION THEN RAISE NoSeats; END IF; EXCEPTION WHEN NoSeats THEN -- error number between -20000 and -20999 EXMessage := 'No seats remaining in offering' || |19| 420 CHAPTER 11 - STORED PROCEDURES AND TRIGGERS to chart\_(NEW,OfferNo) ||'; EXMessage := EXMessage || '# Number of enrolledd: ' || chart(anOffNumEnrolledd) ||'. Similarly, business intelligence developments often lead to data governance initiatives to establish policies for data integration particularly for changes to source data in different parts of an organization. When is a clustering index useful? LivesAt ResidesVersion No BegEffDate EndEffDate ResidesAt Residence Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The conceptual analysis process was presented to demonstrate derivation of result rows for SELET statements involving joins and grouping. Ignore the database design in Chapter 10 when performing the analysis. Analyzing navigation problems will help you gain confidence in translating a problem statement into an ERD and identifying ambiguous and incomplete parts of problem statements. Determine the result of the following SELECT statement: SELECT ProdNextShipDate, ProdMfg, COUNT(\*) AS NumRows FROM Product GROUP BY ProdNextShipDate, ProdMfg. 8. No database writes occur at checkpoint time as database writes are periodically written to disk in ascending age order. Because the Student-Offering and the Offering-Textbook relationships are independent, you know the last textbook used by a student without storing the relationship instances. The aggregation operator takes the greatest common denominator. What are the four kinds of cursor declarations in SQL? Row Condition: a comparison not involving an aggregate function. All of the FDs in Table 7-6 violate the BCNF definition except the last FD (VisNo, PWDNo - DiasName). The finance fact table contains cardinality-measure measures that can be applied across time and enrollment counts in linked degree levels. 8.1.2 Objectives and Constraints: The goal of physical database design is to minimize response time to access and change a database. See also access plan and message. SELECT StuFirstNm, StuLastNm, StuCity, EnrGradYear, StuResidence, Residence ResNo .. Exclusive locks conflict with all other kinds of locks (shared, other exclusive locks, and intent). This section closes by briefly discussing optimistic concurrency control approaches that do not use locks. Type I nested queries are typically used to formulate joins as part of the SELECT and DELETE statements. Recall that M-way relationships are represented by associative entity types in the Crow's Foot ERD notation. If there are no common tables, the nested query executes one time (Type I nested query). The traditional life cycle is mostly a reference framework. 16.4.2 Colorado Education Data Warehouse The Colorado Education Data Warehouse supports reporting of student assessments and growth in K-12 schools in Colorado. How do object DBMSs relax encapsulation? The distribution of values can be specified in a number of ways. Both dimensions and measures are not limited to those discussed in this section. List all columns of the Product table that contain the words ink Jet in the product name. To eliminate periodic reorganizations, dynamic hash files have been proposed. The



CREATE DIMENSION StoreDim LEVEL StoreId IS Store.StoreId LEVEL City IS Store.StoreCity LEVEL State IS Store.StoreState LEVEL Zip IS Store.StoreZip LEVEL Nation IS Store.StoreNation HIERARCHY CityRollup ( StoreId CHILD OF City CHILD OF State CHILD OF Nation ) HIERARCHY ZipRollup ( StoreId CHILD OF Zip CHILD OF State CHILD OF Nation ); The Oracle CREATE DIMENSION statement supports dimensions with levels from multiple source tables. For example, phone numbers and bank routing numbers are not good choices because they contain location information. Table 19-3 lists orders consistent with the dependency diagram in Figure 19.10 for CREATE and DROP statements. The distributed database design and physical database design phases involve efficient implementation. In the early years of personal computers and client-server processing, markup languages for page layout dominated. For the following tables and SQL statements, select indexes (clustering and nonclustering) that balance retrieval and update requirements. Consider a relationship between a dimension for policies and the fact table in problem 10. Note that each table has one row that does not match any row in the other table. You should use the OTHERS exception when you do not need specialized code for each kind of entity. Reduce number of attributes when data collection process cannot parse a compound attribute. The Oracle syntax for using subtypes does not cover INSERT statements such as Example 19.29 involving reference types. Table: a named, two-dimensional arrangement of data. Stored procedures and triggers can be a significant part of large applications, perhaps as much as 25 percent of the code. Most functional components can use multiple indexes on the same table. The fourth part presents data integration architectures and reviews features of Oracle's data integration tools. Triggered UPDATE triggers on the same table can overlap even if the triggers required different columns. For an M-N relationship without triggers, there will not be any functional dependencies that show a need for a table. CREATE TABLE Offering ( OfferNo INTEGER, CourseNo CHAR(6) CONSTRAINT OffCourseNoRequired NOTNULL, OffLocation VARCHAR(50), OffDays CHAR(6) CONSTRAINT OffDaysRequired NOTNULL, OffTime CHAR(6) CONSTRAINT OffTimeRequired NOTNULL, FAcNo CHAR(1), OffTime DATE, CONSTRAINT PROFTRN PRIMARY KEY (OfferNo), CONSTRAINT FKFacNo FOREIGN KEY (FacNo) REFERENCES Faculty ON DELETE RESTRICT, CONSTRAINT FKCourseNo FOREIGN KEY (CourseNo) REFERENCES Course ON DELETE RESTRICT, CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo) REFERENCES Course ON UPDATE CASCADE ) ON UPDATE clause is not Oracle syntax. Physical Record: collection of bytes held in volatile storage in main memory and stable storage on secondary storage. Why is customization important for database programming languages? Prototypes can be implemented rapidly using graphical development tools for generating menus, forms, reports, and other components. Consider the following requirements in your ERD. Student data includes student identifier, address, e-mail, and telephone number. Examples include: a student record, a course record, and a grade record. Examples can be found in older Oracle versions (before 9i). SELECT \* FROM Course WHERE CrsDesc LIKE '%DATA%' CourseNo CrsDesc CrsUnits IS470 BUSINESS DATA COMMUNICATIONS 4 IS480 FUNDAMENTALS OF DATABASE MANAGEMENT 4 CHAPTER 4 Example 4.9 (Oracle). Inexact Matching for a Substring List: the courses containing the string "DATA" in the course description. Because tables are used to communicate ideas in many fields, the terminology of tables, rows, and columns is familiar to most users. Synonyms occur when different parts of an organization use different vocabulary to describe the same concepts. Gartner ([www.gartner.com](http://www.gartner.com)) and the McKinsey Global Institute ([www.mckinsey.com/insights/msi/gap](http://www.mckinsey.com/insights/msi/gap)) provide analysis of big data challenges and opportunities. 7.1.1 Avoidance of Modification Anomalies A good database design ensures that users can change the contents of a database without unexpected side effects. For auditing, security, and communication reasons, it is important that business entities are easily traceable. For more details about mappings and transformations, Chapter 10 describes views and transformations between the external and conceptual levels. Go back to the original FD diagram in which ShipAddr does not determine CustNo. How does your table design change if you want to keep track of a master list of shipping addresses for each customer? Non summarizable dimension fact relationship patterns deviate from the summarizable patterns in the cardinalities for the fact entity type. Positions can be classified as management, associate, or level. Loss of Historical Integrity: an issue for updates to dimension tables. Violations of summarizability constraints distract from the usability of a data warehouse. In an economic sense, entity matching procedures should balance the benefits of consolidated entity lists (true matches and true non matches) against the costs of incorrect actions (false matches and false non matches) plus investigation costs. However, interference can occur on the seats remaining column of a flight table. Section 11.2 depicts the exception section. Microsoft Access provides the AutoNumber data type to generate unique values. Which object DBMS architecture do you think will dominate in five years? After consultations among club members, club management, and vendor management, it was decided to divide the reservation period into two periods (6AM to 2:30PM starting at 7AM and 2:30PM to 10PM starting at 8AM). Identify the concurrency control problem depicted in the following timeline. See also equi-join and natural join. In some ERD notations such as the Crow's Foot notation, a ternary relationship is represented as an associative entity type with three 1-M relationships. The more challenging problems in Chapter 6 emphasize user requirements, diagram transformations, design documentation, and schema conversion. Note that the WITH CHECK OPTION clause cannot be specified in Microsoft Access using the SQL window. A large logical record may be split over multiple physical records. Basic units of data are the byte (one character or 8 bits), kilobyte (KB), megabyte (MB), and gigabyte (GB). How many times is a Type I nested query executed as part of a outer query? Define an ERD that supports the generation of television viewing guides, movie listings, sports listings, public access listings, and cable conversion charts. In each execution of the inner loop, variables used in the outer loop are used in the inner loop. This assumption is appropriate for a single retail store that orders directly from manufacturers. The optimizer will estimate the number of rows using the extended statistics instead of relying on individual column statistics and the independence assumption. Figure 1.18 depicts two possible placements of data administrators and database administrators. Each tablespace is stored on one or more files. All rights reserved. For your reference, the relationship diagram of the university database is repeated from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the purposes of information systems planning? The trigger should map operations on the view to the appropriate base tables excluding the primary keys of each table and the CustNo foreign key of OrderTbl. Union compatibility means that each table must have the same number of columns and each corresponding column must have a compatible data type. The ERD has generic names to help you concentrate on finding diagram errors rather than focusing on the meaning of the diagram. Example 4.52: Single Column Update Give faculty members in the MS department a 10 percent raise. Create a package containing the function in problem 15, the procedure in problem 10, the function in problem 8, and the procedure in problem 6. For consistency rule 9, forbid redundant foreign keys. Visio Professional requires that a foreign key attribute be defined in an entity type to specify a participating relationship. How are cursor attributes referred? DBMSs support transformation of data for decision making. Chapter 3 describes SQL statements to define tables and relationships. The LevelNo column in the CTE is 1 for the root rows in the anchor member. Parallelism is usually done at the partition level, not table level. The string constant "IS4\*" means match strings beginning with "IS4" and ending with anything. In performing the integration, you should assume that every product on a purchase form must come from the same supplier. These issues are not further addressed because they are beyond the scope of DBMSs and database specialists. The goals emphasize both the information content of the database as well as efficient implementation. You should use all kinds of requirements in the view design process. For example, assume that in addition to enrollment in a course offering, attendance in each class session should be recorded. In drawing an ERD, however, the need for an M-N relationship becomes clear. Instead of counting all Student1 rows in a Stdnl group, count only the rows where the club's purpose is social. IBM supported a different approach known as the hierarchical data model. Define polymorphism. In a natural join, the matching condition is equality (equi-join), one of the matching columns is discarded in the result table, and the join columns have the same unqualified names. For example, an important constraint from Chapter 4 (see Figure 9.1). The tMap component rejected two rows for foreign key violations, passing 8 rows to the tOracleOutput component for loading into the SS�ales fact table. Students should learn skills of data modeling, schema conversion, normalization, and physical database design. SELECT Customer.CustNo, CustName, SUM(TrdQty \* TrdPrice) AS SumTradeAmt FROM Customer WHERE Customer.CustNo = Trade.CustNo AND Trade.BETWEEN '2013-01-01' AND '2013-01-31' GROUP BY Customer.CustNo, CustName HAVING TrdType = 'BUY' AND SUM(TrdQty \* TrdPrice) > (SELECT 1.25 \* SUM(TrdQty \* TrdPrice) FROM Trade WHERE TrdDate BETWEEN '2013-01-01' AND '2013-01-31') AND CustNo = Customer.CustNo AND 9. What are the









