Chapter 1

Introduction to Database Management

Solutions

Answers to Review Questions

1.   Redundancy is the duplication of data or the storing of the same data in more than one place. Redundancy wastes space, makes the updating of data more cumbersome and time-consuming, and can lead to inconsistencies.

2.   The problems, other than redundancy, associated with the nondatabase approach to processing data include difficulties accessing related data, limited security features to protect data from access by unauthorized users, limited ability for multiple users to update the same data at the same time, and size limitations.

3.   An entity is a person, place, object, event, or idea for which you want to store and process data. An attribute, which also is called a field or column in many database systems, is a characteristic or property of an entity.

4.   A relationship is an association between entities. A one-to-many relationship exists between two entities when each row in the first entity matches many rows in the second entity and each row in the second entity matches only one row in the first entity.

5.   A database is a structure that can store information about multiple types of entities, the attributes of those entities, and the relationships among the entities.

6.   In a database system, you create a one-to-many relationship by using common columns in the two tables.

7.   An E-R diagram represents a database in a visual way by using a rectangle for each entity, using a line to connect two entities that have a relationship, and placing a dot at the end of a line to indicate the "many" part of a one-to-many relationship.

8.   A database management system (DBMS) is a program, or a collection of programs, through which users interact with a database.

9.   Database design is the process of determining the table structure of the desired database.

10.   A form is a screen object used to maintain, view, and print data from a database.

11.   It is possible to get more information from the same amount of data by using a database approach as opposed to a nondatabase approach because all data is stored in a single database, instead of being stored in dozens of separate files, making the process of obtaining information quicker, easier, and even possible in certain situations.

12.   Sharing data means that several users can have access to the same piece of data and use it in a variety of ways.

13.   The DBA (database administrator or database administration) is the central person or group in an organization in charge of the database and the DBMS that runs the database. The DBA attempts to balance the needs of individuals and the overall needs of the organization.

14.   Multiple copies of the same data in an organization leads to inconsistency because each piece of data can have different values. Controlling redundancy is the result of eliminating, or at least reducing, the multiple copies. Improved consistency is the result of this controlled redundancy.

15.   An integrity constraint is a rule that the data in a database must follow. A database has integrity when the data in it satisfies all established integrity constraints. A good DBMS should provide an opportunity for users to incorporate these integrity constraints when they design the database. The DBMS then should ensure that these constraints are not violated.

16.   Security is the prevention of access to the database by unauthorized users. A DBMS provides security features such as passwords. As additional security, the DBA can assign users to groups and restrict each group to certain data and to certain types of access.

17.   Data independence is the property that lets you change the structure of a database without requiring you to change the programs that access the database. With data independence, you easily can change the structure of the database when the need arises.

18.   In a database environment, file size is a disadvantage because the DBMS is a large program that occupies a great amount of disk space and internal memory. In addition, because all the data that the database manages for you is stored in one file, the database file itself requires a large amount of disk space and internal memory.

19.   The more complex a product is in general (and a DBMS, in particular, is complex), the more difficult it is to understand and correctly apply its features. Because of this complexity, serious problems may result from mistakes made by users and designers of the DBMS.

20.   Some specific inputs which result in big data are mobile devices, digital processes, and even social media exchanges.

21.   In a nondatabase environment, each user has a completely separate system; the failure of any single user's system does not necessarily affect any other user. On the other hand, if several users are sharing the same database, a failure on the part of any one user that damages the database in some way might affect all the other users.

22.   The great complexity of a database structure makes recovery more difficult. In addition, many users update the data at the same time, which means that recovering the database involves not only restoring it to the last state in which it was known to be correct, but also performing the complex task of redoing all the updates made since that time.

23.   [Critical Thinking] Answers will differ, but students should have reasons for their responses. Any error to a student transcript/record, such as incorrect grade, courses not listed correctly; incorrect contact information could be an error that may cause a student to lose a job opportunity, a scholarship, or a loan. It also could affect whether they graduate.

24.   [Critical Thinking] No. The only attributes that would be the same would be contact and demographic information such as, name, address, phone number, age, and gender. Other attributes are specific to the database context. A medical database would have attributes to describe, for example, health conditions, previous appointments, lab results, and medications. A student database would have attributes to describe, for example, courses taken, advisor, GPA, number of credits, and academic major. A fitness database would have attributes to describe for example, membership level, athletic ability, fitness classes, fees, and liability waivers.

Answers to BITS Corporation Exercises

Note: Data and solution files are available at www.cengagebrain.com. Data files consist of copies of the BITS Corporation, Colonial Adventure Tours, and Sports Physical Therapy databases that are usable in Access 2010, Access 2013, and Access 2016; and script files to create the tables and data in these databases in other systems, such as Oracle.

1.   The names of all clients that have a credit limit less than $10,000 are: Hershey, Jarrod; Goduto, Sean; Salazar, Jason; Fisherman's Spot Shop; Seymour, Lindsey; Bonnie's Beautiful Boutique; Yates, Nick; Howler, Laura; MarketPoint Sales.

2.   The descriptions of all items in the Tasks table that have the category DRM are Data Recovery Major and Data Recovery Minor.

3.   The order numbers are 67424 and 67949.

4.   The order date is 09/14/2018 and the scheduled date is 09/24/2018.

5.   The names of the clients are Pritchard's Pizza & Pasta and Harpersburg Bank.

6.   The names of the clients are Seymour, Lindsey and Howler, Laura.

7.   The sum of the balances is 18,746.05.

8.

Order Number	Order Date	Client Number	Client Name
67101	9/6/2018	733	Howler, Laura
67313	9/7/2018	458	Bonnie's Beautiful Boutique
67424	9/10/2018	322	Prichard's Pizza & Pasta
67838	9/10/2018	867	MarketPoint Sales
67949	9/10/2018	322	Prichard's Pizza & Pasta
68252	9/12/2018	363	Salazar, Jason
68868	9/14/2018	867	MarketPoint Sales
68979	9/17/2018	826	Harpersburg Bank

9.

Order Number	Order Date	Client Number	Client Name
67424	9/10/2018	322	Prichard's Pizza & Pasta
67838	9/10/2018	867	MarketPoint Sales
67949	9/10/2018	322	Prichard's Pizza & Pasta

10.   68979, Harpersburg Bank, Christopher Turner

11.   The other attributes that might be in the client table are email and phone number. Answers will vary.

12.   BITS should include job title, job number, and supervisor number. Answers will vary.

13.   BITS might want to track how many times clients check the website, or survey data. They would use web-enabled devices to track this information and would store it in another database. Answers will vary.

Answers to Colonial Adventure Tours Case

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1.   Abrams, Devon, Marston, Rowan, Stevens, Unser

2.   Bloomfield - Maidstone, Chocorua Lake Tour, Mason's Farm, Lake Mephremagog Tour, Long Pond Tour, Lower Pond Tour, Missisquoi River - VT, Northern Forest Canoe Trail, Pontook Reservoir Tour

 3.   Mt Ascutney - North Peak, Baldpate Mountain, Bloomfield – Maidstone, Cadillac Mountain, Mason's Farm, Lake Mephremagog Tour, Lower Pond Tour, Metacomet-Monadnock Trail Hike, Park Loop Ride, Pontook Reservoir Tour, Pondicherry Trail Ride, Westfield River Loop

4.   Bradbury Mountain Ride, Park Loop Ride

5.   Mt Ascutney - North Peak, Mt Ascutney - West Peak, Cadillac Mountain Ride, Cherry Pond, Lake Mephremagog Tour, Mount Cardigan Hike, McLennan Reservation Hike, Missisquoi River – VT, Pondicherry Trail Ride, Seal Beach Harbor, Sawyer River Ride

6.   Mt Ascutney - West Peak, Bradbury Mountain Ride, Blueberry Mountain, Cadillac Mountain Ride, Cannon Mtn, Huguenot Head Hike, Low Bald Spot Hike, Mount Battie Ride, Mount Cardigan Hike, Mount Garfield Hike, Sawyer River Ride

7.   6 (2 for CT and 4 for VT)

8.   Mt Ascutney - North Peak, Long Pond, McLennan Reservation Hike

9.   Bradbury Mountain Ride, Cadillac Mountain Ride, Mount Battie Ride, Westfield River Loop

10.   Gernowski, Mt. Cardigan - Firescrew, Orange

       Bretton-Borak, Chocorua Lake Tour, Tamworth

11.   13

12.   Arethusa Falls, Hiking, Zach Gregory, Hal Rowan; Mt Ascutney - North Peak, Hiking, Miles Abrams, Lori Stevens; Bradbury Mountain Ride, Biking, Rita Boyers, Zach Gregory; Baldpate Mountain, Hiking, Susan Kiley, Glory Unser; Chocorua Lake Tour, Paddling, Harley Devon, Susan Kiley, Glory Unser

13.   Siam Bretton-Borak, Sawyer River Ride, Biking, Chocorua Lake Tour, Paddling;

       Brianne Brown, Sawyer River Ride, Biking, Cadillac Mountain Ride, Hiking;

       Karen Busa, Mount Garfield Hike, Hiking, Mount Battie Ride, Biking;

       Clement Chau, Long Pond, Hiking, Cadillac Mountain Ride, Biking;

       Sadie Gernowski, Bradbury Mountain Ride, Biking, Mt. Cardigan - Firescrew, Hiking;

       Ryan Goff, Mount Cardigan Hike, Hiking, Crawford Path Presidentials Hike, Hiking;

       Liam Northfold, Wachusett Mountain, Hiking, Long Pond, Hiking;

       Arnold Ocean, Mt Ascutney - West Peak, Hiking, Mt Ascutney - North Peak, Hiking

14.   Busa, Mount Battie Ride, Biking; Gernowski, Bradbury Mountain Ride, Biking

15.   Gernowski, Chau, Brown, Marchand, Busa

16.   [Critical Thinking] No. You can calculate the total price by adding the trip price and the other fees and then multiplying by the number of people.

17.   [Critical Thinking] You would place the trip cost field in the Trip table.

Answers to Sports Physical Therapy Case
Note: Data and solution files are available at www.cengagebrain.com. Data files consist of copies of the BITS Corporation, Colonial Adventure Tours, and Sports Physical Therapy databases that are usable in Access 2010, Access 2013, and Access 2016; and script files to create the tables and data in these databases in other systems, such as Oracle.

1.

Patient Number	Last name	First Name
1010	Koehler	Robbie
1011	King	Joseph
1012	Houghland	Susan
1013	Falls	Tierra
1014	Odepaul	Ben
1015	Venable	Isaiah

1016	Waggoner	Brianna
1017	Short	Tobey
1018	Baptist	Joseph
1019	Culling	Latisha
1020	Marino	Andre
1021	Wilson	Tammy

2.   The session numbers are: 29, 31 ,33, 36, and 38.

3.

Last Name	First Name	Street Address
Shields	Anthony	5222 Eagle Court
Risk	Jonathan	1010 650 North

4.   Stephen Wilder does electrical stimulation and Aquatic therapy with therapeutic exercises.

5.

Last Name	First Name	City
Koehler	Robbie	San Vista
Houghland	Susan	Munster
Falls	Tierra	Palm Rivers
Baptist	Joseph	Waterville
Culling	Latisha	San Vista
Wilson	Tammy	Waterville

6.   Steven Wilder.

7.   The codes are: 92507, 97032, 97033, 97035, 97039, 97110, 97112, 97113, 97116, 97124, 97140, 97150, 97530, 097535, 97750, and 98960

8.   Joseph Baptist had ultrasound.

9.

Last Name	First Name	Street	City	State	Zip Code
Culling	Latisha	4238 East 71st St.	San Vista	TX	74071
Koehler	Robbie	119 West Bay Dr.	San Vista	TX	72510

10.   Add rate of pay to the therapists table along with any information needed for tax purposes in order to have complete information on each person. Answers will vary.

11.   The relationship between the two is the unit of time by which the therapy is billed and the number of minutes by which the therapy was performed. Therapies that have no billable time may be performed by the service. The company may bill by LengthOfSession and the UnitOfTime fields. Answers will vary.