Database Processing, 14e **(Kroenke)**
Chapter 1: Introduction

1) The purpose of a database is to help people keep track of things.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

2) In a database, each table stores data about a different type of thing.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

3) Like a database table, a spreadsheet has rows and columns.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Concept

4) In every database, not just the databases discussed in this book, table names are capitalized.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Concept

5) A database shows data in tables and the relationships among the rows in those tables.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To gain a general understanding of tables and relationships
Classification: Concept

6) Data is recorded facts and figures; information is knowledge derived from data.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

7) Databases record data in such a way that they can produce information.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

8) Enterprise Resource Planning (ERP) is an example of a data mining application.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To survey some important and interesting database applications
Classification: Concept

9) Databases are a key component of e-commerce order entry, billing, shipping and customer support.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To survey some important and interesting database applications
Classification: Concept

10) The largest databases in e-commerce are the order entry databases.
Answer: FALSE
AACSB: Information Technology
Difficulty: Difficult
LO: To survey some important and interesting database applications
Classification: Concept

11) The e-commerce companies use Web activity databases to determine which items on a Web page are popular and successful.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the importance of databases in Internet Web applications and smartphone apps
Classification: Concept

12) Small databases typically have simple structures.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To gain a general understanding of tables and relationships
Classification: Concept

13) A database system is typically defined as its four components: users, database applications, the DBMS and the databases.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

14) Databases based on the CODASYL standard are based on the network data model.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

15) Applications are computer programs used directly by users.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

16) Applications usually write data directly to the database.
Answer: FALSE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

17) Sequenced Query Language (SQL) is an internationally recognized standard language that is understood by all commercial database management system products.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

18) In database systems, indexes are held in the database.
Answer: TRUE
AACSB: Information Technology
Difficulty: Difficult
LO: To define the term database and describe what is contained within the database
Classification: Concept

19) A database management system (DBMS) creates, processes and administers databases.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

20) The database management system (DBMS) is responsible for inserting, modifying, reading, and deleting data.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

21) The database application is responsible for concurrency control.
Answer: FALSE
AACSB: Information Technology
Difficulty: Difficult
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

22) The database management system (DBMS) is responsible for enforcing referential integrity constraints.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

23) Referential integrity constraints are rules about what data values are allowed in certain columns.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To define the term database and describe what is contained within the database
Classification: Concept

24) A database is a self-describing collection of non-integrated tables.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term database and describe what is contained within the database
Classification: Concept

25) Integrated tables store both data and the relationships among the data.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term database and describe what is contained within the database
Classification: Concept

26) Microsoft Access is just a DBMS.
Answer: FALSE
AACSB: Information Technology
Difficulty: Easy
LO: To describe the components of a Microsoft Access database system and explain the functions they perform
Classification: Concept

27) Microsoft Access is a low-end product intended for individuals and small workgroups.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To describe the components of a Microsoft Access database system and explain the functions they perform
Classification: Concept

28) The current DBMS engine in Microsoft Access is called ADE.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To describe the components of a Microsoft Access database system and explain the functions they perform
Classification: Concept

29) In Microsoft Access, you can use ODBC to connect to SQL Server in place of the ADE database engine.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of a Microsoft Access database system and explain the functions they perform
Classification: Application

30) In an Enterprise-class database system, a database application interacts with the DBMS.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of an enterprise-class database system and explain the functions they perform
Classification: Concept

31) In an Enterprise-class database system, a database application accesses the database data.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of an enterprise-class database system and explain the functions they perform
Classification: Application

32) In an Enterprise-class database system, business users interact directly with the DBMS, which directly accesses the database data.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of an enterprise-class database system and explain the functions they perform
Classification: Concept

33) All database applications get and put database data by sending SQL statements to the DBMS.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

34) The DBMS ranked as having the "most power and features" in the text is IBM's DB2.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

35) The DBMS ranked as being the "most difficult to use" in the text is Oracle Corporation's Oracle Database.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

36) The DBMS ranked as being the "easiest to use" in the text is Microsoft's SQL Server.
Answer: FALSE
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

37) The DBMS ranked as having the "least power and features" in the text is Microsoft Access.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

38) A database is called *self-describing* because it reduces data duplication.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term metadata and provide examples of metadata
Classification: Application

39) The description of a database's structure that is stored within the database itself is called the *metadata*.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To define the term metadata and provide examples of metadata
Classification: Concept

40) Indexes are data structures that speed searching of database data.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term database and describe what is contained within the database
Classification: Concept

41) Database design is important, and fortunately it is simple to do.
Answer: FALSE
AACSB: Information Technology
Difficulty: Easy
LO: To define and understand database design from existing data
Classification: Concept

42) A database design may be part of a new systems development project.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To define and understand database design as new systems development
Classification: Application

43) A database design is rarely a redesign of an existing database.
Answer: FALSE
AACSB: Information Technology
Difficulty: Easy
LO: To define and understand database design in database redesign
Classification: Concept

44) Each row in a database table is also known as a record.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the history and development of database processing
Classification: Concept

45) Data Language/I (DL/I) structured data relationships as a tree structure.
Answer: TRUE
AACSB: Information Technology
Difficulty: Difficult
LO: To understand the history and development of database processing
Classification: Concept

46) The CODASYL DBTG model structured data relationships as a tree structure.
Answer: FALSE
AACSB: Information Technology
Difficulty: Difficult
LO: To understand the history and development of database processing
Classification: Concept

47) The relational model was first proposed in 1970 by E. F. Codd at IBM.
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the history and development of database processing
Classification: Concept

48) The 1977 edition of this text contained a chapter on the relational model, and that chapter was reviewed by E. F. Codd.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

49) dBase was the first PC-based DBMS to implement true relational algebra on a PC.
Answer: FALSE
AACSB: Information Technology
Difficulty: Difficult
LO: To understand the history and development of database processing
Classification: Concept

50) Paradox is the only major survivor of the "bloodbath of PC DBMS products."
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

51) Business organizations have resisted adopting object-oriented database systems because the cost of purchasing OODBMS packages is prohibitively high.
Answer: FALSE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

52) Bill Gates has said that "XML is the lingua-franca of the Internet Age."
Answer: TRUE
AACSB: Information Technology
Difficulty: Easy
LO: To understand the history and development of database processing
Classification: Concept

53) XML Web services allow database processing to be shared across the Internet.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the importance of databases in Internet Web applications and smartphone apps
Classification: Concept

54) The NoSQL movement should really be called a NoRelational movement.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Application

55) Twitter and Facebook use NoSQL databases.
Answer: TRUE
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the importance of databases in Internet Web applications and smartphone apps
Classification: Concept

56) The purpose of a database is to _____.
A) help people keep track of things
B) store data in tables
C) create tables of rows and columns
D) maintain data on different things in different tables
Answer: A
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Concept

57) A database stores _____.
A) data
B) relationships
C) applications
D) Both A and B are correct
Answer: D
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Application

58) Which of the following statements is true about Web 2.0?
A) It requires the Android Operating System.
B) It allows users to add content to Web sites.
C) Twitter and Facebook are examples of Web 2.0 sites.
D) Both B and C are correct
Answer: D
AACSB: Information Technology
Difficulty: Easy
LO: To understand the importance of databases in Internet Web applications and smartphone apps
Classification: Concept

59) A sales contact manager used by a salesperson is an example of a(n) _____.
A) single-user database application
B) multiuser database application
C) e-commerce database application
D) data mining application
Answer: A
AACSB: Information Technology
Difficulty: Moderate
LO: To survey some important and interesting database applications
Classification: Concept

60) A Customer Resource Management (CRM) system is an example of a(n) _____.
A) single-user database application
B) multiuser database application
C) e-commerce database application
D) digital dashboard
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To survey some important and interesting database applications
Classification: Concept

61) An online drugstore such as Drugstore.com is an example of a(n) _____.
A) single-user database application
B) multiuser database application
C) e-commerce database application
D) enterprise resource planning system
Answer: C
AACSB: Information Technology
Difficulty: Easy
LO: To survey some important and interesting database applications
Classification: Concept

62) The industry standard supported by all major DBMSs that allows tables to be joined together is called _____.
A) Sequential Query Language (SQL)
B) Structured Question Language (SQL)
C) Structured Query Language (SQL)
D) Standard Question Language (SQL)
Answer: C
AACSB: Information Technology
Difficulty: Easy
LO: To describe the components of a Microsoft Access database system and explain the functions they perform
Classification: Concept

63) A program whose job is to create, process and administer databases is called a _____.
A) Database Modeling System
B) Database Management System
C) Data Business Model System
D) Relational Model Manager
Answer: B
AACSB: Information Technology
Difficulty: Easy
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

64) Microsoft Access includes _____.
A) a DBMS
B) an application generator
C) a Web server
D) Both A and B are correct
Answer: D
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of a Microsoft Access database system and explain the functions they perform
Classification: Application

65) Microsoft Access may use which of the following DBMS engines?
A) ADE
B) SQL Server
C) Oracle
D) Both A and B are correct
Answer: D
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of a Microsoft Access database system and explain the functions they perform
Classification: Concept

66) Which of the following is **not** an XML Web service standard?
A) SOAP
B) WSDL
C) Ethernet
D) UDDI
Answer: C
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the importance of databases in Internet Web applications and smartphone apps
Classification: Concept

67) Which of the following statements is **not** true for an enterprise-class database system?
A) The database application(s) interact(s) with the DBMS.
B) The database application(s) directly access(es) the database data.
C) The DBMS accesses the database data.
D) The application generates SQL statements.
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of an enterprise-class database system and explain the functions they perform
Classification: Application

68) Which of the following database systems is **not** enterprise-class?
A) Microsoft SQL Server
B) Microsoft Access
C) Oracle Database
D) IBM DB2
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of an enterprise-class database system and explain the functions they perform
Classification: Concept

69) In an enterprise-class database system, reports are created by _____.
A) the user
B) the database application
C) the database management system (DBMS)
D) the database
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To describe the components of an enterprise-class database system and explain the functions they perform
Classification: Concept

70) Which of the following statements is **not** true about client-server architecture?
A) The client initiates a request.
B) The server is usually a tablet or smartphone.
C) The server usually runs the DBMS on it.
D) Most Web applications are supported by client-server.
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the importance of databases in Internet Web applications and smartphone apps
Classification: Concept

71) In database systems, the DBMS enforces rules about which data can be written in certain columns. The rules are known as _____.
A) data insertion control
B) data modification control
C) concurrency control
D) referential integrity constraints
Answer: D
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

72) In database systems, the DBMS enforces rules about which user can perform which action when. The rules are known as _____.
A) referential integrity constraints
B) data modification control
C) data reading control
D) concurrency control
Answer: D
AACSB: Information Technology
Difficulty: Difficult
LO: To define the term database management system (DBMS) and describe the functions of a DBMS
Classification: Concept

73) A database is considered *self-describing* because _____.
A) all the users' data is in one place
B) it reduces data duplication
C) it contains a description of its own structure
D) it contains a listing of all the programs that use it
Answer: C
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

74) A database consists of integrated tables, which store _____.
A) reports
B) data and relationships among the data
C) forms
D) Both A and C are correct
Answer: B
AACSB: Information Technology
Difficulty: Easy
LO: To understand the nature and characteristics of databases
Classification: Concept

75) Which of the following statements is **not** true for primary keys in a relational database system?
A) They can be used to create relationships between tables.
B) They must contain numeric data.
C) They uniquely identify a row in a table.
D) They can be part of relational integrity constraints.
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To gain a general understanding of tables and relationships
Classification: Concept

76) This database component is used to maintain database accuracy and enforce data constraints.
A) Tables
B) Metadata
C) Triggers
D) Stored procedures
Answer: C
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Concept

77) This database component can be used as part of applications and for administration tasks.
A) Tables
B) Metadata
C) Triggers
D) Stored procedures
Answer: D
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Concept

78) A database designed using spreadsheets from the Sales department is a database being designed _____.
A) from existing data
B) as a new systems development project
C) as a redesign of an existing database
D) as a NoSQL database
Answer: A
AACSB: Information Technology
Difficulty: Moderate
LO: To define and understand database design from existing data
Classification: Application

79) A database designed to implement requirements for a reporting application needed by the Sales department is a database being designed _____.
A) from existing non-database data
B) as a new systems development project
C) as a redesign of an existing database
D) Both A and B are correct
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To define and understand database design as new systems development
Classification: Application

80) A database designed to combine two databases used by the Sales department is a database being designed _____.
A) from existing data
B) as a new systems development project
C) as a redesign of an existing database
D) Both A and B are correct
Answer: C
AACSB: Information Technology
Difficulty: Moderate
LO: To define and understand database design in database redesign
Classification: Application

81) Database professionals use _____ as specific data sources for studies and analyses.
A) data marts
B) normalization
C) data models
D) entity-relationship data modeling
Answer: A
AACSB: Information Technology
Difficulty: Moderate
LO: To define and understand database design from existing data
Classification: Concept

82) Database professionals use a set of principles called _____ to guide and assess database design.
A) database extraction
B) normalization
C) data models
D) entity-relationship data modeling
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To define and understand database design from existing data
Classification: Concept

83) A very popular development technique used by database professionals for database design is known as _____.
A) database extraction
B) normalization
C) data models
D) entity-relationship data modeling
Answer: D
AACSB: Information Technology
Difficulty: Moderate
LO: To define and understand database design as new systems development
Classification: Concept

84) A very popular development technique used by database professionals to adopt a database design to a new or changing requirement is known as _____.
A) normalization
B) data models
C) entity-relationship data modeling
D) database migration
Answer: D
AACSB: Information Technology
Difficulty: Difficult
LO: To define and understand database design in database redesign
Classification: Concept

85) The predecessor(s) of database processing was (were) _____.
A) file managers
B) hierarchical models
C) network models
D) the relational data model
Answer: A
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

86) Which statement is **not** true about the relational model?
A) It was first proposed in 1970.
B) It was developed by E. F. Codd.
C) It was developed at Oracle.
D) It resulted in the DBMS product DB2.
Answer: C
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

87) Modern microcomputer personal DBMS products _____.
A) are supplied by several well-established manufacturers
B) were essentially made obsolete by Microsoft Access
C) have poor response time
D) are not true DBMS products
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

88) Business organizations have resisted adopting object-oriented database management systems because _____.
A) the cost of purchasing OODBMS packages is prohibitively high
B) the cost of converting data from relational databases to OODBMSs is too high
C) most large organizations have older applications that are not based on object oriented programming
D) Both B and C are correct
Answer: D
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

89) For database development, the most important Web-related technology to emerge in recent years is _____.
A) FTP
B) HTTP
C) XML
D) OODBMS
Answer: C
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the importance of databases in Internet Web applications and smartphone apps
Classification: Concept

90) For database development, a challenge to the relational model and the use of SQL is known as _____.
A) the Web services movement
B) the NoSQL movement
C) the SOAP movement
D) the XML movement
Answer: B
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the history and development of database processing
Classification: Concept

91) What is the purpose of a database, and how does the database accomplish this purpose?
Answer: The purpose of a database is to help people keep track of things. It accomplishes this purpose by storing data in tables. Each table has rows and columns, similar to a spreadsheet. A database usually has multiple tables in order to keep track of different but related things. For example, we might have a CUSTOMER table to keep track of customers and a PRODUCT table to keep track of the things we sell. Each row in each table holds data about a particular instance, i.e., one customer or one product. The database also stores the links between the tables, so that we can track which customers bought which products (note: this will require an additional table if one customer can buy more than one product **and** one product can be sold to more than one customer).
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Application

92) What are the four components of a database system?
Answer: The four components in a database system are: the user, the database application, the database management system (DBMS) and the database. The user interacts with the database application, which interacts with the DBMS, which controls the database. The functions of the database application include creating and processing forms, creating and transmitting queries and creating and processing reports. The DBMS creates databases, tables and supporting structures, manages database data, enforces rules and provides security. The database stores the user data, the database metadata, indexes, triggers, stored procedures and application metadata.
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Application

93) Briefly describe the function of an application program in a database system.
Answer: The application program is responsible for creating and processing forms. The application displays the form to the user, allows the user to complete the data entry, evaluates the form to determine which data management tasks need to be performed, and transmits the appropriate requests to the DBMS. The application creates and transmits queries. The queries are requests for data that are created in a language like SQL, and transmitted to the DBMS to have the requested data returned to the application program. The application also creates and processes reports. The query to retrieve the necessary data for the report is sent to the DBMS. When the DBMS returns the needed data, the application manipulates it as necessary to create the requested report. The application program also applies application logic to control the manipulation of data in accordance with the business rules. Finally, the application program is responsible for providing control. Control must be exercised to allow the users to make choices for functions and tasks as appropriate for their jobs. Also, control must be exercised to manage the activities of the DBMS.
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Application

94) What components are included in a database?
Answer: The database contains user data, metadata, indexes and other overhead data, and application metadata. User data is the data from the user's environment that they want to track. Metadata is data about the structure of the database. Indexes and other overhead data are structures that the database uses to improve performance. Finally, the application metadata is data about forms, reports, and other application components that some databases, particularly those created with desktop DBMS products, store with the database.
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term database and describe what is contained within the database
Classification: Application

95) Why do we say a database is *self-describing* and why is this an advantage?
Answer: A database is considered self-describing because it contains a description of its own structure within the database itself. This description is called the metadata, and it is stored in specialized tables in relational databases. The advantage is that the database is self-documenting, and that a knowledgeable user or a database designer can easily access the metadata. All DBMS vendors provide tools to access the metadata within their products.
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term metadata and provide examples of metadata
Classification: Concept

96) What is *metadata* and how does it relate to the definition of a database?
Answer: Metadata is data about the structure of the database itself. This includes data about the names of all the tables in the database, the names of all the columns in each of the tables, the data type of each column in each table, the properties of the tables and the columns, etc. Metadata accounts for the *self-describing* aspect of the definition of a database as a "self-describing collection of integrated tables."
AACSB: Information Technology
Difficulty: Moderate
LO: To define the term metadata and provide examples of metadata
Classification: Concept

97) Briefly describe the function of the DBMS in a database system.
Answer: The DBMS creates the database and the tables and structures within it. The DBMS also reads and updates the database data. It receives requests from application programs to perform data maintenance tasks. These requests are translated into actions that are performed on the database. In addition to maintaining the user data within the database, the DBMS also maintains the database structures. The DBMS also enforces any rules that have been defined to govern the values of the data, such as data type requirements and referential integrity constraints. The DBMS controls concurrency issues, which deal with the unwanted interruption of one user's work by another user's work. As the only point of entry into the database, the DBMS also provides security for the database to restrict users' access to only the data that they have authority to read or modify. Finally, the DBMS is responsible for the creation of backup copies of the database data and for restoring the database in case a recovery is required.
AACSB: Information Technology
Difficulty: Moderate
LO: To understand the nature and characteristics of databases
Classification: Application

98) What are *referential integrity constraints*? Give an example.
Answer: A referential integrity constraint is a rule that restricts certain actions on the database data. A referential integrity constraint is used to ensure that the values in a field in one table have matching tables in a corresponding field in another table. These constraints are enforced by the DBMS, which will not allow changes to the values of the database that would result in violations of this rule. For example, a database has an EMPLOYEE table and a VEHICLE table that are used to store data on employees and the vehicles that they are assigned to drive. The EMPLOYEE table has a column called EmployeeID that is used to distinguish one employee record from another. The VEHICLE table also has an EmployeeID column that is used to associate a vehicle with the appropriate employee. A referential integrity constraint could be used to prevent a vehicle from being assigned to an employee with an EmployeeID that does not appear in the EMPLOYEE table by requiring that all values in EmployeeID in the VEHICLE table have a matching value in EmployeeID in the EMPLOYEE table.
AACSB: Information Technology
Difficulty: Difficult
LO: To gain a general understanding of tables and relationships
Classification: Application

99) What are the three types of database design situations?
Answer: Database designs can be based on (1) existing data, (2) new systems development and (3) database redesign. Database designs from existing data may be based on data in spreadsheets or other data tables, or on data extracted from other databases. New systems development gathers user requirements for needed applications and designs a database to meet those requirements. Database redesign may be needed to migrate existing databases to a newer DBMS, or to integrate multiple existing databases.
AACSB: Information Technology
Difficulty: Moderate
LO: To define and understand database design from existing data
Classification: Concept

100) Briefly describe the history of database processing.
Answer: The predecessor of database processing was file processing, where data were maintained on magnetic tape. Database processing as we know it today became possible with the availability of direct access disk storage in the 1960s. Using this storage, both the hierarchical data model and then the network data model were developed. In 1970, E. F. Codd of IBM proposed the relational model, which is the standard model used today. Current DBMSs such as DB2, Oracle and SQL Server are based on the relational model. The appearance of microcomputer-based DBMSs in the 1980s led to a "bloodbath" from which Microsoft Access emerged as the dominant PC workstation DBMS. More recent events include the introduction of object-oriented DBMSs (OODBMSs), and the development of tools such as XML to allow the use of database systems over the Internet.
AACSB: Information Technology
Difficulty: Difficult
LO: To understand the history and development of database processing
Classification: Application