Readings

Read Chapter 1 T-SQL Query Fundamentals.

Homework Questions

SQL = structured query language

1. How does the book describe the difference between imperative and declarative languages?

The book distinguishes imperative and declarative by defining declarative languages as those that require you to specify what you want to get. This is opposed to imperative languages which focuses on the *how*. For example you would define how the language is going to process the data. SQL, or structured query language requires that you specify the *what* so that the relational database management system can figure out what mechanics are required to process the request/output. The RDBMS is based on set theory and predicate logic.

1. List three categories of command statements in SQL

* First category: Data Definition Language (DDL)
* 🡪object definitions and statements to include: CREATE, ALTER, DROP
* Second category: Data Manipulation Language (DML)
* 🡪Query and modify. Statements: SELECT, INSERT, UPDATE, DELETE, TRUNCATE, MERGE
* Third category: Data Control Language (DCL)
* 🡪 Permissions. Statements: GRANT, REVOKE

1. Give an informal definition of database as used in the expression \relational database management system." Give an informal definition of database as used in the expression \Human Resources database."

* Database respective to RDMS: a form of structured storage using rows and columns
* Database respective to Human Resources Database: A large container or space that holds data pertinent to Human Resources.

1. How does SQL implement three-valued predicate logic?

* SQL implements three-valued predicate logic but referencing three logical values – true, false, and unknown. A three-valued predicate logic would be used where a statement would yield unknown by using a special marker.

1. How does SQL enforce entity integrity? What is entity integrity?

* SQL uses constraints, or rules to enforce integrity. A certain type of constraint called a candidate key works to enforce entity integrity by preventing more than one occurrence of the same row (tuple) in a relation. It also works by distinguishing a primary key as opposed to alternate keys.

1. How does SQL enforce referential integrity? What is referential integrity?

* Referential integrity is enforced using a constraint called a foreign key. Foreign keys refers to one or more attributes of a relation (referencing relation) and references a candidate in either the same or different relation.

1. What is a relation as defined in the textbook? A one word answer to this question is sufficient.

* table

8. Is this table in first normal form? Why or why not? If it is not, how would you change it?

create table faculty (

facID int primary key,

facName text,

facCreds text);

facID facName facCreds

1 Alan Alda BA, MA

2 Bridgette Bardot BS, MS, PhD

3 Casey Cason AA, BBA, MBA, DEd

* The table is in 1NF (first normal form) because the rows are unique and the attributes are atomic. For every row there is a unique first and last name.

9. Is this table in second normal form? Why or why not? If it is not, how would you change it?

create table pets (

ownerID int primary key,

petID int primary key,

ownerFirstName text,

ownerLastName text,

petName text,

petType text);

ownerID petID ownerFirstName ownerLastName petName petType

1 1 Dom Delouise Rex German Shepherd

1 2 Dom Delouise Lacy Border Collie

2 3 Emilio Estevez Midnight Persian Cat

* I do not believe that this table is in 2NF because there are nonkey attributes that depend on only part of a candidate key. For example, the PetID and OwnerID are the same

10. Is this table in third normal form? Why or why not? If it is not, how would you change it?

create table friends (

friendID int primary key,

friendName text,

friendStreet text,

friendCity text,

friendState text,

friendZip text);

ID FirstName LastName Street City State Zip

1 Fred Flintstone 123 Rock Quarry Rd Bedrock GA 31905

2 Greta Garbo 456 Starlit Ave Paris FL 30019

3 Harry Houdini 789 Hidden Glen Lane Alcatraz CA 00000

Yes I believe that this table is in 3NF because you need the friendID (primary key) to find the full name and address. The Name, street, city, state, and zip code all depend on the friendID

11. List the components of a four-part object name.

* Server name, database name, schema (namespace) name and object name

12. What is the difference between declarative data integrity and procedural data integrity?

Procedural data integrity is enforced with code while declarative data integrity is enforced as part of the model through table definitions.

Homework Exercises

1. Install SQL Server Express on a personal computer. See the appendix of the book, Getting Started, if

you run into problems. Please, please check the system requirements before you do this. You cannot

install SQL Server on a hand held device or an internet appliance. This may take a couple of hours

but you can read the text book while you are waiting.

2. Install SQL Server Management Studio on a personal computer. See the cautions above. This may

take a long time as well.

3. We will be downloading and installing the database the text uses. Read the Introduction. This can be

obtained from http://aka.ms/T-SQLFund3e/downloads.

*Notes*

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