COMP- 8115-M50 Database systems

Quiz – 2

1) **[25 pts] Discuss the main categories of data models. What are the basic differences among the relational model, the object model, and the XML model? (Question 2.2, page 55 in Chapter 2)**

Answer:

The main categories of data models are:

Conceptual model

Logical model

Physical model

Before discussing the differences let's understand the different models mentioned they are

Relational model –

It stores the data in the form of tables, views and indexes and they are separate from the physical storage structures. The difference means the database administrators can manage physical data storage without affecting access to that data as a logical structure.

Object model –

An object model consists of data and methods. But a table often has primary key as one of its columns (or several columns). A table often has foreign keys used to refer to other rows in other tables or the same table

XML model –

This data model provides an abstract representation of one or more XML documents or fragments.

The differences between the relational model, the object model, and the XML model are

In the relational model, columns have the same type of data whereas in the object model the interaction of the application with external resources is defined. But, In the XML model, the data are in the hierarchical model. Different data are combined in a single document.

2) **[25 pts] What is the difference between procedural and non-procedural DMLs? (Question 2.6, page 55 in Chapter 2)**

Answer:

Data Manipulation does the following tasks are

1. retrieval of information from the database
2. insertion of new information into the database
3. deletion of information in the database
4. modification of information in the database

A DML is a language which enables users to access and manipulate data.The goal is to provide efficient human interaction with the system.

There are two types of DML:

procedural: the user specifies what data is needed and how to get it
Example:
Example of Data Manipulation Language Using Java:

```
try{
        Statement st = connection.createStatement();
        ResultSet rs = st.executeQuery("SELECT * FROM students");
        while(rs.next){
                String s = rs.getString(1);
        }
} catch(SQLException e){}
```

Resultset declare what data is needed, which are included in the line of the SQL query SELECT * FROM students. While the while line states the way to retrieve the data.

Note: The above example is a reference from the google.

nonprocedural: It is where the user only specifies what data is needed.

Example:

```
INSERT INTO Employee (Id, LastName, FirstName)
VALUES (7, 'Polneni', 'Srividya')
```

Note: The above example is a reference from google.

3) **[50 pts] Assume that you're designing an Amazon-like online bookstore database system. Design a schema for that database application, using the notation of 2.1. What types of additional information and constraints would you like to represent in the schema? Think of several users of your database, and design a view for each along with sample data.**

Answer:

Let's assume we want to design a basic online reading system that provides the following functionality:

- Searching the database of books and reading a book.
- User membership creation and extension.
- Only one active user at a time and only one active book by this user

The class Online Reader System represents the body of our program. We could implement the class such that it stores information about all the books deals with user management and

refreshes the display, but that would make this class rather hefty. Instead, we've chosen to tear off these components into Library, User Manager, and Display classes.

The classes:

1. User/Customer
2. Book
3. Library
4. User Manager
5. Display
6. Online Reader System

We are building the amazon book store database system so we have tables like

Best sellers Table

That includes columns like

Book ID, Book Name, Author Id, Author Name, Price

Data types are Book ID -- Int, Book Name --- String , Author Id --- Int , Author Name ---String, Price ---Int

Customer Table

That includes columns like

First Name, Last name, Customer Id, Address, Phone Number

Data types are First Name -- String, Last name -- String, Customer Id -- Int, Address -- String, Phone Number --Int

Order Table

That includes columns like

Tracking ID, Book ID, Customer ID, Address

Whereas Tracking ID is the primary key, Book ID, the Customer ID is the Foreign key, Address is the Foreign key

Here the data is simple with their column names, datatypes and constraints. The primary key is the unique one and the foreign key is the column of data in a relational database that provides relations or links between two tables.