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CSC6302 Module 03

Quiz One

1.) Physical Level: This describes how a data record is physically stored on a disk, or hard drive for example. Someone that would be concerned with this level could be a system architect, or the administrator of the database. This is because they are worried about making sure the storage, access, and organization of the data is as efficient as possible.
Logical Level: This describes the data that is stored in a database in a structured way, and the relationships among the data elements (for example, the database schema). Someone that would be concerned with this level could be designers of the database or software programmers. This is because they need to create a model of the database that aligns with whatever application they are working with. For example, using SQL to interact with the database and the program.
View Level: This provides a customized view of the data specific for the user. It is meant for application programs to hide details of data types, and views can hide information for security purposes. This allows users to only see the data that is relevant to them and are based off requirements of the application. Someone that would be concerned with this is any end users/ who is running the application program. This gets rid of unnecessary data that could be confusing/unimportant to the user. Also, the provider of the application could be concerned since this is also important for security and privacy of the data.

2.) Looking at the Material Relation:
   a.) There are 3 relations in the Material table, so we would do 2^(n) – 1 --> 2^(3) – 1 --> 8 – 1 = 7 so this results in **7 Super Keys**
   b.) The super keys of the Material Relation are: {**MaterialName, Color, IsMachineWashable}, {MaterialName, Color}, {MaterialName, IsMachineWashable}, {Color, IsMachineWashable}, {MaterialName}, {Color}, {IsMachineWashable}**
   c.) The candidate keys of the Material Relation are: **{MaterialName, Color, IsMachineWashable}, {MaterialName, Color}, {MaterialName, IsMachineWashable}, {MaterialName}.** I chose these because the other 3 don't make sense. MaterialName must be in the key since that is the most unique way to identify a material; they are all different. There could be multiple materials with the same color, and the material being machine washable or not is just a yes or no question; many will have the same value.
   d.) The primary key for the Material Relation would be: {**MaterialName}**. Out of the 4 candidate keys, while any of them would work this is the simplest since it is only one relation and is still just as unique as you can get. There will not be more than one material with the same name in the data table.

e.) Material(MaterialName varchar(100), Color varchar(50), IsMachineWashable tinyint(1))

3.) SQL script to create a table for SewingPattern:

```
CREATE TABLE IF NOT EXISTS SewingPattern (
PatternName varchar(100) not null,
PublisherName varchar(200) not null,
SkillLevel int not null,
MaterialName varchar(100) not null,
Yardage double not null,
PRIMARY KEY (PatternName)
);
```

4.) Using the database diagram of Player, Score, and Game:

a.)
```
SELECT GameName
FROM Game
WHERE DeveloperName = 'Capcom';
```

b.)
```
SELECT P.UserName, G.GameName
FROM Player, Game
WHERE P.FavoriteGame = G.Id;
```

5.) Also using the database diagram of Player, Score, and Game:

a.)
```
SELECT DeveloperName, GameName
FROM Game
ORDER BY DeveloperName, GameName;
```

b.)
```
SELECT count(distinct PlayerId) as NumPlayers
FROM Score
WHERE GameId = (SELECT Id
                FROM Game
                WHERE GameName = 'Asteroids') AND Score >= 185000;
```

c.)
```
SELECT G.GameName, max(Score) as HighScore
FROM Game, Score
WHERE Score.GameId = G.Id
ORDER BY G.GameName;
```