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Q-1.]  Discuss the differences sublanguages that were discussed in class. What operations would you typically expect to be available in each language?

Ans-

Data manipulation, such as insertion, deletion, updating, and modification, is necessary once it has been stored or populated. The database management system supplies a collection of languages for these tasks (DBMS). In order to read, update, and store data in a database, database languages are employed.

1. Data Definition Language (DDL)- It is language that defines your data and relationship with other data. E.g- Create, Alter, Rename, Drop, Truncate etc.

2. Data Manipulation Language (DML) - It is language that provides data manipulation techniques such as delete, insert etc.

3. Data Control Language ( DCL) – DCL is used for giving privilege access to the users. Example-grant.

4. Transaction Control Language (TCL)-It is used to execute changes done by DML statements example: Rollback.

Q-2.] Discuss the function and importance of the system catalog.

Ans-

A system catalog is a collection of tables and views that provide important database information. There are objects which holds up information about database and System catalog is the collection of such objects. The database engine refers to the system catalog for data that is required to run the system smoothly.

System catalog purpose for implementation to separate into logical groups of objects to grant access to all users. So, if user wants to see what privileges he has then he can just look up into system catalog. Admin should have all the rights to see all the activities and structure of database. So, some objects can only see by the admin of database.

The system catalog allows users and database administrators to maintain order, as well as the database server.

Q-3.] What is a transaction? Give an example of a transaction

Ans-

Transaction is nothing but number of actions that is performed on the database. If the transaction contains set of actions and if anyone of it fails, then all changes get rollback.

Example:

It will select top records from Student database when the transaction gets complete. If somehow if it fails to fetch records, then all the transaction will get rollback.

BEGIN TRAN

INSERT INTO [student].[Student] (

          [id], [FirstName], [LastName], [Course])

SELECT Top 3  [id], [FirstName], [LastName], [Course]

FROM [student].[Student]

COMMIT TRANSACTION


Q-4.] Discuss the function and importance of conceptual modeling.

Ans-

Conceptual data model represents entity and relationship. In this model square represents entity and line between them represent relation between those entities. It can be easily drawn on white paper and can be easily updated.

Features:

1. Highly abstract - means it doesn't contain detailed information and it has overall summary of the database.

2. Easily understood- It can be easily understood by both technical or non-technical person.

3. Easily enhanced- As it is not a digital document it can be enhanced easily.

4. In these only entities are visible not the attributes of the database.

5. It has abstract relationship meaning which columns of entities are connected are not defined and it consist only information that 2 entities are connected.

Q-5.] Explain the concept of database schema and discuss the three types of schema in a database

Ans- Schema is the structure and representation of the database. It specifies how the data has arranged and relationship between them. It contains a description of the database that may be visualized using schema diagrams. Moreover, it is used for defining relationship between entities in a schema.

Schema has 3 types

1. Logical Schema- It refers to a database that has been designed at a logical level.

2. Physical Schema.- It refers to a database that has been designed at a physical level.

3. View Schema.- It refers to a database that has been designed at a view level.

Example- if we have data table name Student , employee table requires name, student_id and student_email_id . Schema for student table would be as follows.

Student table

name: String

student_id: String

email_id: String

Q-6.] What is logical and physical independence?

Ans –

Physical Data independence is described as to make changed in the lowest level of database that is physical level without tampering the database higher level schemas. So performing any operations in the physical level won't affect the logical and view level. Modifications in the physical level like inserting new files shouldn't affect other 2 levels.

Logical data independence is defined as changing schema at the middle level which is at logical level that is view level. So performing any operations in the logical level won't affect the other 2 levels  and  an entire application.


Q-7.] Given the file structure shown in below table, answer Problems i–iiii.

| PROCECT_CODE | PROJECT_MANAGER | MANAGER_PHONE | MANAGER_ADDRESS | PROJECT_COST |
|---|---|---|---|---|
| 21-5Z | Holly B. Parker | 904-338-3416 | 3334 Lee Rd,  Gainseville, FL 37123 | 84373 |
| 25-2D | Jane D.Grant | 615-098-9909 | 218 Clark Blvd, Nashville, TN 35445 | 234235.99 |
| 25-5A | George Don | 515-227-1234 | 124 Rive Dr, Franklin, TN 29112 | 34523422.98 |
| 25-9T | Holly B. Parker | 904-338-3416 | 3334 Lee Rd,  Gainseville, FL 37123 | 434555.98 |
| 27-4Q | George Don | 515-227-1234 | 124 Rive Dr, Franklin, TN 29112 | 3390000.9 |
| 29-2D | Holly B. Parker | 904-338-3416 | 3334 Lee Rd,  Gainseville, FL 37123 | 34566666.88 |
| 31-7P | Willam Bates | 904-445-2716 | 216 Morton Rd, Stetson, FL 30155 | 33444.76 |

i. How many records does the file contain? How many fields are there per record?

Ans- There are 7 records in the file. There are total 5 fields per record.

ii. What problem would you encounter if you wanted to produce a listing by city? How would you solve this problem by altering the file structure?

Ans- Problem to produce listing by city would be tough as it is present inside the address field. To overcome this problem, there should be separate column for the city field.

iii. If you wanted to produce a listing of the file contents by last name, area code, city, state, or zip code, how would you alter the file structure?

Ans- Problem to produce listing of file last name, area code, city, state, or zip code they are embedded inside the columns, and they don't have their separate column. To solve this, we can split and create new columns for them.

iiii. What data redundancies do you detect? How could those redundancies lead to anomalies?

Ans- In the file, Holly B. Parker appears 3 times in 3 different records. The file has to be updated according to right information. Holly B Parker.  Also needs to make sure that she has entered right details. It might be a problem if anything is wrong. Even if the data comes from the same person, the problem will consider it differently.