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Assignment : 1

Q.1 What is DBMS ? Explain its Advantages

→ A database management system (DBMS) is a collection of programs that manages the database structure and controls access to the data stored in the database.

Advantages:-
1) Reduction of Redundancies:
Centralized control of data by the DBA avoids unnecessary duplication of data and effectively reduces the total amount of data storage required.
It also eliminates the extra processing necessary to trace the required data in a large mass of data.

2) Elimination of inconsistency:- The main advantage of avoiding duplication is the elimination of inconsistency that tend to be present in redundant data files.
Any redundancies that are present in DBMS are controlled and the system ensures that these multiple files are consistent.

3) Shared Data:- A database allows sharing of data under its control by any number of application programs or users. For example the applications for the public relations and payroll departments can share the same data.

- 4.) Integrity :- Centralized control can also ensure that adequate checks are incorporated in the DBMS to provide the data integrity. Data integrity means that the data contained in the database is both accurate and consistent. Therefore data values being entered for the storage could be checked to ensure that they fall within a specified range and are of the correct format.
- 5.) Security :- Data is of vital importance to an organization and may be too confidential. Such confidential data must not be accessed by unauthorized persons. Different levels of security could be implemented for various types of data and operations.
- 6.) Data independence : The ability to modify a scheme definition at one level without affecting a scheme definition at the next higher level is called data independence.

d.2 What is abstraction ? Explain its levels
Data

→ Database systems are made up of complex data structures. To ease the user interaction with databases, the developers hide internal irrelevant details from the users. This process is called as data abstraction.

There are 3 levels of data abstraction:

1. Physical level
2. Logical level
3. View level

1.) Physical Level :- → Lowest level

- Describes how the data is actually stored
- Also known as internal schema
- Contains the definition of stored records
- The method of representing the data field.

2.) Logical Level :- → Middle level

- Defines what data is actually stored
- also what relationships exist among those data
- also known as conceptual schema

3.) View Level:- → Highest level

- Describes only the part of entire database which exist to specify the interaction with the system
- Also known as user level

Q.3 Who is Database Administrator? Explain the various functions of DBA.

- A person who has central control of both data and the programs accessing those data are called a database administrator.

Functions of DBA:

- Schema definition:- DBA creates database schema by executing DDL statements.
- Storage Structure :- By access method definition : Database tables or index are stored in flat files , heaps, B+ tree, etc
- Storage and physical organization modification : The DBA carried out changes to the existing schema by physical organization
- Granting authorization for data modification:- DBA provides different access rights to the users according to their levels.
- Routine Maintenance : → Takes backup of database period
 - ensures if there's enough disk space ^{available}
 - monitors jobs running on database
 - ensures performance is not degraded

Q.4 Why data models are used in database ? Explain its components.

- Data models gives an idea of how the final system will look after its complete implementation. It defines the data elements. Data models are used to show how data is stored, connected, accessed and updated in the DBMS.

Q5 Define

- 1) Entity :- An entity is a person, place, thing or event about which the data are to be collected and stored. Each entity occurrence is unique and distinct.
- 2) Attribute :- An attribute is the characteristic of any entity. Ex. Customer entity can be described by attributes such as name, phone, gender.
- 3) Relationship :- A relationship describes an association among entities. Eg. Relationship exists between publisher and book can be described as : many book are published by a publisher.
- 4) Tuple :- Each row in a relation contains unique value which is known as a tuple.
- 5) Degree :- The total no. of attributes which is the relation is called the degree of the relation.
- 6) Cardinality :- Total no. of rows present in a table.

Q6 Note On :

- 1) Primary key :- It must contain unique values. It cannot have null value.
- 2) Alternate key :- It is a column or group of columns in a table that uniquely identify each row in that table.

3) Candidate key :- It is a set of attributes that uniquely identifies tuples in a table.

4) Attribute or the descriptive properties which are owned by each entity of an entity set:

→ Simple attribute: Cannot be divided further

→ Composite attribute: Composed of many other simple attributes

→ Single valued attribute: Can take only one value for a given entity from an entity set

→ Multi valued attribute: Can take more than one value for a given entity from an entity set

→ Derived attribute: Derived from other attributes

→ Key attribute :- It can identify an entity uniquely

→ Strong entity :- Always has a primary key. Represented by a rectangle. Primary key represented by underline. members are called dominant entity set. It helps identify its members.

→ Generalization:

Form of abstraction that specifies that 2 or more entities that share common attributes can be generalized into a higher level entity type called as supertype. The lower one becomes subtype and is dependent entities.

→ Specialization: It is the abstraction process of introducing new characteristics to an existing class of objects to create one or more new class of objects. This involves taking a higher level entity and using additional characteristics generating lower level entity also inherit the characteristics of the higher level entity.

Q7. Explain relationships with its types.

- A relationship describes relation between entities.
It is represented by using ~~square~~ diamond or rhombus.
There are 3 types of relations between entities.

1) Binary Relationship:

- Relation between 2 entities.
→ Cardinality constraint defines the max no. of relationship instance in which one entity can participate.
- a) one to one :- When only one instance of an entity is associated with the relationship it is marked as '1:1'.
 - b) one to many :- When more than one instance of an entity is associated with the relationship it is marked as '1:N' or '1:n'. Only one instance on left and more than one on right can be associated.
 - c) many to one :- When more than one instance of an entity is associated with the relationship it is marked as 'N:1' or 'M:1'. Only one instance on right and more than one on left can be associated.
 - d) many to many : more than one instance of an entity on both sides can be associated with a relationship.

2) Recursive Relationship :- When an entity is related with itself it is known as recursive relationship.

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3.) Ternary Relationship :- Relationship of degree there is called as ternary relationship.

Q.8. Explain DDL and DML commands.

→ DDL Commands are CREATE, ALTER, DROP.

CREATE :- Creates object eg. table in Database.

ALTER :- Alters objects eg. modifying a column in database.

DROP :- Delete objects or remove table from database.

DML Commands are SELECT, INSERT, UPDATE

SELECT :- It is used to retrieve data from a table.

INSERT :- Insert new data into table.

UPDATE :- Updates or modifies existing data.