OS ASSIGNMENT 1

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Q1. What is DBMS? Explain its advantages.

Ans. 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 Inconsistencies
   The main advantages of avoiding duplication is the elimination of inconsistencies that tend to be present in redundant data files. Any redundancies that exist in the DBMS are controlled and the system ensures that these multiple copies are consistent.
3. Shared Data
   A database allows the 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 data

integrity. Data integrity means that the data contained in the database is both accurate and consistent. Therefore, data valve 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 confidential. Such confidential data must not be accessed by unauthorised 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 is one level without affecting a scheme definition to the next higher level is called data Independance.

Q2. What is Data Abstraction? Explain its levels.

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

The Three level of abstraction are:

1) Physical Level
2) Logical Level
3) View Level

~~1) Physical level : The physical level of abstraction is the~~

1) Physical level : • Lowest level
~~• described how~~
• describes how the data is actully stored
• also known as internal schema.
• contains the definition of stored records
• The method of representing the data field
• expresses the internal view of the acess aids used.

2) Logical level : • ~~medic~~ middle level
• defines what data are actully stored
• also what relationships exist among ~~that~~ those data.
• also known as conceptual schema.

3) View level : • highest level
• describes only the part of entire database which exicts to simplify the interaction ~~of~~ with the system.
• also known as User level.

Q3. Who is Database Administrator? Explain the various functions of DBA.

Ans. A person who has central control of both data and the programs accessing those data are called a Database Administrator.

Functions of DBA:

• Schema ~~Defination~~ Definition : DBA creates database schema by executing DDL statements.

- Storage structure cy access method definition: Database tables or indexes are stored in flat files, heaps, B+ Tree etc.
- Storage and physical organization modification: The DBA carries out changes to the existing schema by physical organisation.
- Granting authorization for data modification: DBA provides different access rights to the users according to their level.
- Routine Maintenance:
  - takes backup of database periodically
  - ensures if theres enough disk space
  - Monitors jobs running on database
  - ensures that performances is not degraded

Q4. Why data Models are used in database? Explain its components.

Ans. Data models gives an idea that how the final system will look like after its complete implimentation. It defines the data elements and the relationships between the data elements. Data Models are used to show how data is stored, connected, accessed and updated in the database management system.

Q5. Define.

Ans. a) 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.

b) Attribute: An Attribute is the characteristic of any Entity. Ex. CUSTOMER entity can be described by attributes such as name, phone, gender.

c) Relationship: A relationship describes an association among entities. Ex. Relationship exists between publisher and book can be described as : Many books are published by a publisher.

d) Tuple : Each row in a relation contains unique value which is known as a tuple

e) Degree : The total number of attributes in which in the relation is called the degree of the relation

f) Cardinality: Total number of rows present in the table.

Q6. Note on.

a) Primary Key :
- A primary must contain unique values.
- It cannot have NULL value

b) Alternate Key :
- is a column or group of columns in a table that uniquely identify every row in that table.

c) Candidate Key: is a set of attributes that uniquely identify tuples in a table.

d) Attribute are the descriptive properties which are owned by each entity of an Entity set.

Types:

1. Simple Attribute : Cannot be divided further
2. Composite Attribute : Composed of many other simple attributes.
3. Single Valued Attribute : can take only one value for a given entity from an entity set.
4. Multi Valued Attribute : can take more than one value for a given entity from an entity set.
5. Derived Attribute : derived from other attributes.
6. Key Attribute : key attribute can identify an entity uniquely in an entity set.

e) Strong Entity :

- always has a primary key.
- represented by a rectangle symbol.
- contain primary key represented by Underline symbol
- The member of a strong entity set is called as dominant entity set.
- Primary key helps identify its member

f) Generalization : form of abstraction that specifies that two or more entities that share common attributes can be generalized into a higher level entity-type called as supertype. The lower level entity becomes the subtypes to the super-type and is dependent entities.

g) Specialization: • Specialization is the abstracting process of introducing new characteristics to an existing class of objects to create one or more new classes of objects. This involves taking a higher-level entity & using additional characteristics, generating lower-level entities also inherit the characteristics of the higher level entity.

Q7. Explain relationship with its types.

Ans. A Relationship describes relation between entities. It is represented using diamond or rhombus.

There are three types of relationships that exist between Entities.

• Binary Relationship: • relation between two Entities.
• Cardinality constraint defines the max number of relationship instance in which an entity can participate.

one to one – when only one instance of an entity is associated with the relationship, it is marked as '1:1'. one instance of each entity should be associated with the relationship.

one to many – When more than one instance of an entity is associated with a relationship it is marked as '1:N' or '1:M'. Only one instance of entity on the left and more than one instance of an entity on the right can be associated with the relationship.

many-to-one - When more than one instance of entity is associated with the relationship, it is marked as 'N:1' OR 'M:1'. more than one instance of an entity on the left and only one instance of an entity on the right can be associated with the relationship.

Many-to-many - more than one instance of an entity on the left and more than one instance of an entity on the right can be associated with the relationship.

- Recursive Relationship: when an Entity is related with itself it is known as Recursive Relationship.

- Ternary Relationship: • Relationship of degree three is called Ternary relationship.
  • A Ternary relationship involves ~~these~~ three entities.

08. Explain DDL and DML commands.

DDL command are CREATE, ALTER, DROP

- CREATE - Creates objects e.g. table in the database
- ALTER - Alters objects of the database eg. modifying a column of a table.
- DROP - Deletes objects from the database eg remove table from a sql database.

DML command are SELECT, INSERT, UPDATE,

- SELECT : This command or statement is used to retrives data from a table.
- INSERT : Inserts new data into talele.
- UPDATE : Updates or modifies existing data into a table.