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Class : FY BSC CS
Subject : Database Management system (DBMS)

Assignment 1

1) 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 of DBMS :

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 advantage 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

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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 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 confidental. Such confidental data must ~~be~~ not be accessed by unathorized 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 in one level without affecting a scheme definition in the next higher level is called data independence.

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2) 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 as:
i) Physical level.
ii) Logical level.
iii) View level.

i) Physical level: It is the lowest level of abstraction that describes how the data is actually stored. Also known as internal schema, which contains the definition of the stored record, the method of representing data fields, It expresses the internal view and the access aids used.

ii) Logical level: It is the middle level of abstraction which defines what data are actually stored and what relationships exist among those data. Also known as conceptual schema.

iii) View level: It is the highest level of abstraction which describes only the part of entire database which exists to simplify the interaction with the

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system. Also known as user level.

3) 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 Database Administrator (DBA).

Functions of DBA :-

- Schema Definition: The DBA creates the database schema by executing DDL statements.
- Storage structure and access method definition: Database tables or indexes are stored in flat files, heap, B+ Tree etc.
- Schema and physical organization modification: The DBA carries out changes to the existing schema and physical organization.
- Granting authorization for data modification: The DBA provides different access rights to the users according to their level.
- Routine Maintenance: DBA takes up backup of database periodically. It ensures enough disk space is available all the time. It monitors jobs running on the database. It performs tuning. It ensures that performance is not degraded by

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some expensive task submitted by some users.

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

Ans:- Data models are used in database because It is a logical structure of database. It provide general idea ~~of~~ that about the structure that how the final system will be seen after its complete implimentation. It describes the design of database to reflect entities, attributes, relationship among data, constraints etc.

The purpose of a data model is to represent data and to make the data understandable.

5) 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 ~~occ~~ occurrence is unique and distinct.

b) Attribute : An attribute is the characteristic of any entity. for e.g. Customer entity can be describes by ~~or~~ attribute such as name, phone, address, gender.

c) Relationship : A relationship describes an association among entities. e.g. Relationship

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exists between publishers and book can be described as: Many books are published by a publisher.

d) Tuple: Each row in a table contains unique record which is known as tuple.

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

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

6) Write a note on following:

Ans: a) Primary key:
A primary key is a field in a table which uniquely identifies each row in a database table. It must contain Unique value. It cannot have NULL value. A table can have only one Primary key.

b) Alternate key: It is a column or group of column in a table that uniquely identify every row in a table. It is not the Primary key.

c) Candidate key:- ~~It is~~ A set of attribute which can uniquely identify a tuple is known as

Candidate key.

d) d) Attribute: It is a property or characteristic of an entity. An entity may contain any number of attributes.

Types:

1) Single Attribute: An attribute which cannot be further subdivided into components is a simple attribute. e.g. Id number of an employee.

2) Composite attribute: An attribute which can be splitted into components is a composite attribute. Example: The address can be further splitted into house number, street number, pincode etc.

3) Single valued attribute: The attribute which takes up only a single value for each entity. e.g. The age of student.

4) Multi-valued attribute: The et attribute which takes up more than a single value for each entity. E.g. Phone number of student: landline and mobile.

5) Derived attribute: An attribute that can be derived from other attribute.
e.g. Total and average marks of student.

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e) Key Attribute: It can identify an entity uniquely in an entity set.

e) Strong Entity: It has a primary key. Its existence is not dependent on any other entity. It is represented by rectangle symbol. It contain primary key represented by underline symbol. The member of a strong entity set is called as dominant entity set.

f) Generalization: It is the process of extracting common properties from a set of entities and create a generalized entity from it. It is a bottom-up approach in which two or more entities can be generalized to a higher level entity if they have some attributes in common.

g) Specialization: In these, an entity is divided into sub-entities based on their characteristics. It is a top down approach where higher level entity is specialized into two or more lower level entitygies.

Q.7 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 Relationships : · relation between two entity.
· Cardinality constraint defines the max numbers of relationship instance in which ~~one~~ an entity can participate.

One to one : When ~~only~~ 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 side 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.

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* Ternary Relationship : Relationship of degree three is called Ternary relationship. A Ternary relationship involves three entities.

Q.8. Explain DDL and DML commands.

Ans: DDL commands are Create, ALTER, DROP.

- Create : Create objects e.g. table in the database.
- ALTER : Alter objects of the database. e.g. modifying a column of a table.
- DROP : Deletes object from the database. e.g. 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 : Insert new data into table.
- UPDATE : Updates or modifies existing data into a table.