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Class : FYIT Subject :- DBMS

Assignment - 1

1.] What is DBMS ? Explain its advantages.

Ans : a] A database management system (DBMS) is a collection of programs that manages database structure and contains access to the data stored in the database.

b] The DBMS serves as the intermediary between user and database. The database structure itself is stored as a collection of files so we can access data in these files through DBMS.

c] The purpose of database is to store and retrieve information in a way that is accurate and effective and to manage different database it contains (performance, security, availability, etc).

Advantages of DBMS :-

a] Shared data : A database allows sharing of data under its control by any number of users. For example, the application of public relation and payroll departments can share the same data.

b] Reduction of Redundancies : Centralized control of data by DBA avoids unnecessary duplication of data and effectively reduces total amount of data storage required. It also eliminates extra processing to trace required data in large mass of data.

c) Data Independence: The ability to modify a schema definition in one level without affecting schema definition in next higher level is called data independence. Application programs should be as independent as possible from details of data representation and storage. The DBMS can provide an abstract view of data to insulate application code from such details.

2) What is Data Abstraction? Explain its levels.

Ans: Database system are made up of complex data structure. To ease the user interaction with database, the developers hide internal irrelevant details from user. This process of hiding irrelevant details from user is called data abstraction. The three levels of abstraction are :-

- a) Physical level
- b) Logical level
- c) View level

a) Physical Level: The physical level of abstraction is lowest level of abstraction that describes how data is actually stored. The physical level or internal level schema, which contains the definition of stored record method of representing data fields, express internal view and the access aids used.

b] logical level : The logical level of data abstraction defines what data are actually stored in database and what relationships exist among those data. In relation DBMS, conceptual schema describes all relations that are stored in the database.

c] View level : This is highest level of abstraction as seen by user. This level of abstraction describes only part of entire database which exists to simplify interaction with the system.

Q] What is Database Administrator? Explain the various functions of DBA.

Ans: A person who has control over system is called a Database Administrator (DBA).

The following are the functions of Database administrator:

a] Schema Definition: The DBA creates database schema by executing DDL statements. Schema includes logical structure of database table like data type of attributes, length of attributes, integrity constraints, etc.

b] Storage structure and access method definition: The DBA carries out changes in tables or indexes stored in flat files, heaps, B+ tree, etc.

c] Schema and Physical organization modification: The DBA carries out changes to existing schema and physical organization.

d) Granting authorization for data modification:
The DBA provides different access rights to the users according to their level ordinary users might have higher restricted access to data, while you go up in hierarchy to the administrator, you will get more access rights.

e) Routine Maintenance: Some of the routine maintenance activities of DBA are given below:

- i] Taking backup of database periodically
- ii] Ensuring enough disk space is available
- iii] Monitoring jobs running on the database
- iv] Performing tuning.
- v] Ensure that performance is not degraded by some expensive task submitted by some users.

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

Ans: A database model defines logical structure of Database. It describes design of database to reflect entities, attributes, relationship among data and constraints on an organization.

a) Hierarchical Model: This database model organises data into a tree like structure with single root to which all other data is linked. The hierarchy starts from root data and expands like tree, adding child nodes to the parent nodes. In this model a child node will only have a single Parent node.

b.] Network model : In network data model, data model data are represented by collections of records. Relationship among data are represented by links. In this data model, graph data structure is used. It permits a record to have more than ^{one} ~~more~~.

c.) Relation Model : Relational model is most popular model and most extensively used model. In this model data can be stored in tables and this storing is called as relation, the relations can be normalized and normalized relation values are called atomic values. Each row in relation contains unique value and it is called as tuple, each column contains value from same domain and it is attribute.

5.] Define :-

i.] Entity : An entity is a person, place, thing or event about which data are to be collected and stored. An entity is fundamental item in any data model as it is distinguishable i.e. each entity occurrence is unique and distinct.

ii.] Attribute : An attribute is characteristic of any entity. For eg: customer entity can be described by attribute such as name, phone, address, gender. Each attribute is associated with a set of values called domain.

- iii] Tuple : It is nothing but a single row of table, which contains a single record.
- iv] Degree : The total number of attributes which in relation is called degree of relation.
- v] Cardinality : Total number of rows present in the table.
- 6] Write a note on Following :
- a] Primary key : The Primary key constraint uniquely each record in a table. Primary keys must contain unique values and cannot contain NULL values. A table can have only one primary key and in table Primary key consist of single/multiple columns.
 - b] Alternate key : Alternate key is a secondary key. If a table has more than one candidate key, one of them will become primary key and rest of all are called alternate key. Example, Student contain (Name, Roll No, ID). Here Roll No is primary key and rest of all columns like NAME, ID are alternate key.
 - c] Candidate key : Candidate key is set of attributes that uniquely identify types of table. Candidate key is super key with no repeated attributes. The primary key should be selected from candidate key.

d] Attribute and its Types : Attributes are descriptive properties which are owned by each entity of an entity set. There exist a specific domain or set of values for each attribute from where the attribute can take its value. The different types of attribute are :

i.] Simple attribute : Simple attribute are those attributes which cannot be divided further.

ii.] Composite attribute : Composite attribute are those which are of many other simple attributes.

iii.] Single Value attribute : Those attributes which can take only one value for a given entity from an entity set.

iv.] Multi valued attribute : Those attributes which can take one value for given entity from an entity set.

v.] Derived Attributes : Those attributes which can be derived from other attributes.

vi.] Key attributes : Those attributes which can identify an entity uniquely in an entity set.

e] Strong entity : Strong entity set always has a Primary key. It is represented by a rectangular symbol. It contains a primary key represented by underline symbol. The member of strong entity set is called as domain entity set. Primary key is one of its attributes which helps to identify its member.

f] Generalization: A generalization hierarchy is a form of abstraction that specifies that two or more entities that share common attributes can be generalized into higher level entity type called supertype. The lower level of entities becomes the subtypes to the supertype 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 higher level entity and using additional characteristics generating lower level entities. The lower level entities also inherit the characteristics of higher level entity.

7] Explain relationship with its type

Ans 8 A relationship describes relation between entities. Relationship is represented using diagram. There are three types of relationship that exist between entities

a] Binary Relationship: It means relation between two entities cardinality constraint defines maximum number of relationship instance in which an entity can participate

Many - to - Many
Cardinality Ratios.

Many - to - One

One - to - Many

One - to - One

b] Recursive Relationship : When an entity is related with itself it is known as recursive relationship. In the below example an employee can be a supervisor or can be supervised, so there is a recursive relationship.

c] Ternary Relationship : Relationship of degree three is called Ternary relationship. A ternary relationship involves three entities. In such relationship we always consider two entities together and then look upon the third.

8] Explain DDL and DML commands

Ans: DDL - DDL stands for Data Definition Language. DDL changes structure of table like creating a table, altering a table, etc. All command of DDL are auto-committed that means it permanently save all changes in the database. Commands that come under DDL are :

a] CREATE : It is used to create new Table.

b] DROP : It is used to delete both the structure of database. This change could be either to modify and record stored in the table.

c] ALTER : It is used to alter the structure of the Database. This change could be

either to modify the characteristics of an existing attribute or probably add new attribute

Syntax :- To add new column in table

ALTER TABLE table - Name

ADD column - name column - definition

DML :- DML stands for Data Manipulation language. DML commands are used to modify the database. It's responsible for all form of changes in database. The command of DML is not autocommitted that means it can't permanently save all changes in the database.

Commands that come under DML are :-

a) INSERT :- It is used to insert data into the row of a table.

Syntax :- INSERT INTO TABLE - NAME VALUES (value1, value2, ..., ValueN);

b) UPDATE :- It is used to update or modify the value of a column in the table.

Syntax :- UPDATE TABLE - NAME
SET [column-name = value1, ...]
WHERE CONDITION

c) DELETE :- It is used to remove one or more row from a Table.

Syntax :- DELETE FROM TABLE - NAME
WHERE CONDITION.