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DBMS I

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.

- Some of its advantages are :-
  - Reduction of Redundancies
  - Elimination of Inconsistencies
  - Shared data
  - Integrity
  - Security.

2) What is Data Abstraction ? Explain its levels.

Ans: The process of hiding irrelavant details from the users is called data abstraction.

- The three levels of abstraction are as :-

a) Physical level - It is the lowest level of abstraction that describes how the data is actually stored.

b) Logical level :- It defines what data are actually stored in the database and what relationships exist among those data.

c) View level - It is the highest level of abstraction as seen by a user.

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

Ans:- One of the main reasons of using DBMS is to have a central control of both data and programs accessing that data. A person who has such control over the system is called DBA.

- The various functions of DBA are:-
  - Schema function - the DBA creates the database schema by executing DDL statements. Schema includes the logical structure of database table (relation) like data type of attributes, length of attributes etc.
  - Storage structure and access method definition - Database tables or indexes are stored in flat files, B+ trees, heaps 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.

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

Ans:- They are used to represent data and to make the data understandable.
- There are four components:-

1) Entity Integrity - Each instance of an entity type must have a unique identifier that is not null.

2) Referential Integrity Constraints - The rules concerning the relationship between entity types.

3) Domains - The constraints on valid values for attributes.

4) Triggering operations - It aims at protecting the validity of attribute values.

5) Define – entity, attribute, relationship, tuple, degree, cardinality.

1) Entity – An entity is a person, place, thing or event about which the data are to be collected and stored. Eg:- ~~Customer,~~ CUSTOMER, STUDENT, etc.

2) Attribute – An attribute is the characteristic of any entity. Each column in a table.

3) Relationship – A relationship describes an association among entities. For example:- a relationship exists between publisher and a book can be described as: Many books are published by a publisher.

4) tuple – Each row in a relation contains unique value and it is called tuple.

5) Degree – The total number of attributes which in the relation is called the degree of the relation.

6) Cardinality – total numbers of rows present in the table.

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6) Write a note on following :-

a) Primary key — It is a field in a table which uniquely identifies each row/record in a database table. Primary key must contain unique values. And, a primary key column cannot have NULL values.

b) Alternate key — It is a column or a group of columns in a table that uniquely identify every row in that table. All keys which are not primary key are called as Alternate key.

c) Candidate key — It is A set of attributes that uniquely identifies identify tuple in a table. Candidate key is a super key with no repeated attributes.

d) Attribute and its types — An attribute is a characteristic of an entity.
- There are five types of attributes :-

1) Simple attributes — ~~Those~~ Those attributes which cannot be divided into further.

2) Composite attributes — Those attributes which are composed of many other simple attributes.

3) Single Valued attributes — Those attributes which can take only one value ~~from a~~ for a given entity from an entity set.

4) Multi Valued attributes — Those attributes which can take more than one value for a given entity from an entity set.

5) Derived attributes — Those attributes which can be derived from other attributes.

e) Strong entity — It is the one whose existence does not depend on the existence of any other entity in a schema. It is denoted by a single rectangle.

f) Generalization — It is like a bottom-up approach in which two or more entities of lower level combine to form a higher level entity if they have some attributes in common.

g) Specialization — It is a top-down approach and it is opposite to Generalization. In specialization, one higher level entity can be broken down into two lower level entities.

7) Explain relationship with its types.

Ans :- A relationship describes an association among entities. — There are ~~three~~ four types of relationships :-

1) One to One relationship — It is used to create a relationship between two tables in which a single row of the first table can only be related to one and only one records of a second table.

2) One to Many relationship — It is used to create relationships between two tables. Any single rows of the first table can be related to one or more rows of the second tables.

3) Many to One relationship — The rows of second tables can only relate to ~~the~~ only ~~row~~ one row in the first table.

4) Many to Many relationship — Each record of the first table can relate to any records (or no records) in the second table. Similarly, each record of the second table can also relate to more than one record of the first table.

8) Explain DDL and DML commands.

Ans:— Data definition language (DDL) is used for creating tables, schema, indexes, constraints etc. in a database.

Commands are CREATE, ALTER, DROP.

CREATE — table, database, object.
ALTER — modifying the structure
DROP — deleting the structure.

— Data Manipulation language (DML) is a language that enables users to access or manipulate data as organized by the appropriate data model.

Commands are SELECT, INSERT, UPDATE, DELETE

SELECT — retrieve data from a database
INSERT — insert data into a table
UPDATE — updates existing data within a table.
DELETE — deletes all the records from the database table.