ASSIGNMENT

* + 1. Database:

A database is an organized collection of structured data, typically stored electronically in a computer system. It is designed to efficiently manage, store, and retrieve data, allowing for easy access, manipulation, and analysis.

* + 1. Table:

A table is a fundamental component of a relational database. It represents a collection of related data organized into rows (also called records) and columns (also called fields). Each column in a table corresponds to a specific attribute, while each row represents a single record or entity.

* + 1. Record:

A record, also known as a row or tuple, is a single instance of data stored in a table within a database. It contains a collection of related data values representing a single entity, such as a person, product, or transaction.

* + 1. Field:

A field, also known as a column or attribute, is a single data element within a table in a database. It represents a specific characteristic or property of the entities represented by the records in the table.

* + 1. Primary Key:

A primary key is a unique identifier for each record in a table within a database. It ensures that each record can be uniquely identified and distinguishes it from all other records in the table. Typically, a primary key is composed of one or more columns, and it must have unique values for each record and cannot contain null values.

* + 1. SQL:

SQL (Structured Query Language) is a domain-specific language used for managing and manipulating data in relational database management systems (RDBMS). It provides a standard syntax and set of commands for performing various operations such as querying data, modifying data, defining database structures, and managing user access controls.

* + 1. Query:

A query is a request for information or action sent to a database management system (DBMS) using SQL or other database query languages. It retrieves specific data from one or more tables based on specified criteria or conditions.

* + 1. Index:

An index is a data structure used to improve the speed of data retrieval operations in a database. It contains keys extracted from the columns of a table and pointers to the corresponding rows. Indexes facilitate quick searching, sorting, and retrieval of data by reducing the need for scanning the entire table.

* + 1. Normalization:

Normalization is the process of organizing data in a database to reduce redundancy and dependency by dividing large tables into smaller tables and defining relationships between them. It aims to eliminate data anomalies, such as insertion, update, and deletion anomalies, and ensure data integrity and consistency.

* + 1. Database Management System(DBMS):

A Database Management System (DBMS) is a software application or system that enables users to create, manage, and interact with databases. It provides tools and utilities for defining database structures, storing and retrieving data, enforcing security controls, and managing transactions and concurrency.

2.1.1. Purpose of a Primary Key:

The primary key in a database table serves as a unique identifier for each record within the table. It ensures data integrity by preventing duplicate records and facilitating efficient data retrieval and manipulation operations. For example, in a table storing employee information, the Employee ID column can be designated as the primary key, ensuring that each employee record has a unique identifier.

2.1.2. Difference between DBMS and Database:

A database is an organized collection of structured data, while a Database Management System (DBMS) is software that facilitates the creation, management, and interaction with databases. In other words, a database is the actual repository of data, while a DBMS is the software that enables users to store, retrieve, and manipulate that data.

2.1.3. Importance of Normalization in Database Design:

Normalization is crucial in database design to eliminate data redundancy, dependency, and anomalies, thereby improving data integrity and consistency. By organizing data into smaller, well-structured tables and defining relationships between them, normalization reduces the risk of data inconsistencies and makes the database more flexible and adaptable to changes. For example, in a database for a library, normalization can prevent the duplication of author information by storing authors' details in a separate table and linking them to books through a foreign key relationship. This ensures that any updates to author details are reflected consistently across all related records, improving data integrity.