

TASK 1

DOMAIN: DATA ANALYSIS WITH SQL

1. Introduction to Database

A database is an electronically stored, systematic collection of data. It can contain any type of data, including words, numbers, images, videos, and files. You can use software called a database management system (DBMS) to store, retrieve, and edit data.

Importance of Databases

Data Organization – Databases offer systematic structures to store and arrange data effectively. This arrangement not only upholds data integrity but also eradicates duplications and reduces the occurrence of discrepancies. By providing a coherent framework, databases ensure efficient data management.

Data Retrieval – Databases excel at swiftly and effectively retrieving information. They can execute intricate queries on extensive datasets in a matter of seconds, providing remarkable efficiency in data retrieval. This capability proves indispensable for managing and extracting insights from large volumes of information.

Data Integrity – Databases ensure data accuracy and consistency through thoughtful design and well-defined constraints. Validation rules play a crucial role by preventing the addition of erroneous or incompatible data and upholding the integrity of the stored information.

Scalability – Databases can be made more accommodating to increasing data volumes and user demands through scalability. This can involve upgrading hardware to scale vertically or adding more servers to scale horizontally. Scalability ensures efficient management of resources to meet the evolving requirements of the system.

Security – Databases provide essential security functionalities such as user authentication, authorization mechanisms, and strong encryption protocols. These measures collectively safeguard sensitive data from any unauthorized access, ensuring the confidentiality and integrity of the information stored.

2. SQL - Structured Query Language.

It can execute queries, retrieve data, insert records, update records.

Basic element:

- Literals – Fixed data value. Eg: “Raunak”, ‘8’.
- Data Types – Associate with the fixed set of properties with the value – char or varchar. Numeric, date & time and strings (3 categories). Numeric – int (integer – 11 digit), small int (up to 5 digits). Date & time – yyyy-mm-dd (1973-12-30), String – char & varchar (char – a fixed string – b/w 1 & 255 character & varchar – variable length string – 1 & 225 character)
- Nulls : - empty value in column
- Comments : Text that is not executed - /*.....*/ ,--.....

Syntax:

- Select: -
select name, owner
from pet; (pet table)

select * from pet; (when to select all the columns from pet table)

select distinct name (unique)
from pet;

select all name (tell all the duplicate column)
from pet;

DDL commands: - defining, redefining, modifying, dropping various database objects.
- Create: create table student;
- Alter:
Alter table student
Add(name varchar (25));

Alter table student
Modify(age number(9,2));

Alter table student
Drop name;
- Drop : drop table student;