1. What is a database? Differentiate between SQL and NoSQL databases.

* Database : Collection of Data that is organized and stored in a way that makes it easy to access , manage and update. It can used to store a wide range of info. including customer ,financial records ,inventory data.
* SQL and NoSQL are two diff. types of database
* SQL databases or Relational databases ,use a structured data model based on tables that are linked together using relationships. SQL (Structured Query Language) to access and manipulate data. E.g. MySQL, Oracle, and SQL server.
* No SQL/Non-relational database model that allows for greater flexibility and scalability. NoSQL database do not use tables and relationships but instead use document-oriented or key-value data stores. Used for big data and real-time web applications. E.g. MongoDB, Cassandra, Redis.

2. What is DDL? Explain why CREATE, DROP, ALTER, and TRUNCATE are used with an example.

* DDL stands for Data Definition Language and refers to asset of SQL commands used to define and manipulate the structure of a database. DDL commands are used to create, modify, and delete database objects such as tables, indexes, views, and procedures.
* Examples: 1. CREATE: Used ton create new database objects such as table, view, or index. E.g. To create a new table called “employees” with columns ID, name, and salary,
* CODE: CREATE TABLE employees ( id INT PRIMARY KEY , name VARCHAR(50) , salary DECIMAL(10,2) );
* DROP : This command is used to delete a database object. For example, to delete the "employees" table we just created, we could use the following SQL command:
* CODE: DROP TABLE employees;
* ALTER: This command is used to modify the structure of an existing database object, such as a table or view. For example, to add a new column called "department" to the "employees" table, we could use the following SQL command:
* CODE: ALTER TABLE employees ADD department VARCHAR (50);
* TRUNCATE: This command is used to delete all data from a table, but not the table structure itself. For example, to remove all records from the "employees" table, we could use the following SQL command:
* CODE : TRUNCATE TABLE employees;

3. What is DML? Explain INSERT, UPDATE, and DELETE with an example.

* DML stands for Data Manipulation Language and refers to a set of SQL commands used to modify data within a database. DML commands are used to insert, update, and delete data in database tables.
* INSERT: This command is used to add new data to a table. For example, to insert a new record into the "employees" table we created earlier, we could use the following SQL command:
* CODE : INSERT INTO employees (id, name, salary, department) VALUES (1, 'John Smith', 50000, 'Sales');
* UPDATE: This command is used to modify existing data in a table. For example, to update the salary of the employee with ID 1 to 60000, we could use the following SQL command:
* CODE : UPDATE employees SET salary = 60000 WHERE id = 1;
* DELETE: This command is used to delete data from a table. For example, to delete the employee with ID 1 from the "employees" table, we could use the following SQL command:
* CODE : DELETE FROM employees WHERE id = 1;

4. What is DQL? Explain SELECT with an example.

* DQL stands for Data Query Language and refers to a set of SQL commands used to retrieve data from a database. DQL commands are used to query database tables and retrieve specific data based on specified criteria.
* SELECT: This command is used to retrieve data from one or more database tables. For example, to retrieve all records from the "employees" table, we could use the following SQL command:
* CODE : SELECT \* FROM employees;
* This command would retrieve all records from the "employees" table and return them as a result set.
* For example, to retrieve only the names and salaries of all employees in the "sales" department, we could use the following SQL command:
* CODE : SELECT name, salary FROM employees WHERE department = 'Sales';

5. Explain Primary Key and Foreign Key.

* Primary Key: A primary key is a unique identifier for a record in a table. It is a column or set of columns that uniquely identifies each row in the table. The primary key is used to ensure that each record in the table is unique and to establish relationships between tables. It is typically used as a reference by foreign keys in other tables.
* For example, in a table of employees, the primary key might be the employee ID column. Each employee would have a unique employee ID, which could be used as a reference by foreign keys in other tables, such as a table of employee salaries.
* Foreign Key: A foreign key is a column in a table that refers to the primary key of another table. It is used to establish relationships between tables by linking data from one table to data in another table. The foreign key ensures that the data being referenced is valid and that referential integrity is maintained.
* For example, if we have a table of employee salaries, we might have a column that refers to the primary key of the employee table. This column would be the foreign key, and it would ensure that each employee's salary is associated with the correct employee record in the employee table.

6. Write a python code to connect MySQL to python. Explain the cursor() and execute() method.

import mysql.connector

# Establish a connection to the MySQL database

mydb = mysql.connector.connect(

host="localhost",

user="yourusername",

password="yourpassword",

database="yourdatabase"

)

# Create a cursor object to execute SQL queries

mycursor = mydb.cursor()

# Execute a SELECT query

mycursor.execute("SELECT \* FROM employees")

# Fetch all rows from the result set

myresult = mycursor.fetchall()

# Print the rows

for row in myresult:

print(row)

* import the mysql.connector module, which allows us to connect to a MySQL database from Python. We then establish a connection to the MySQL database using the mysql.connector.connect() method and pass in the necessary connection details such as the host, username, password, and database name.
* we create a cursor object using the cursor() method of the connection object. The cursor object is used to execute SQL queries and retrieve data from the database.
* We then execute a SELECT query using the execute() method of the cursor object. The query is passed as a parameter to the execute() method.
* After executing the query, we fetch all rows from the result set using the fetchall() method of the cursor object. This method returns a list of tuples, where each tuple represents a row from the result set.

7. Give the order of execution of SQL clauses in an SQL query.

* FROM: The FROM clause specifies the table or tables from which to retrieve data. It is the first clause to be executed in a SELECT statement.
* WHERE: The WHERE clause filters the data based on specified conditions. It is executed after the FROM clause.
* GROUP BY: The GROUP BY clause groups the data based on specified columns. It is executed after the WHERE clause.
* HAVING: The HAVING clause filters the grouped data based on specified conditions. It is executed after the GROUP BY clause.
* SELECT: The SELECT clause retrieves the data from the specified columns. It is executed after the WHERE, GROUP BY, and HAVING clauses.
* ORDER BY: The ORDER BY clause sorts the data based on specified columns. It is executed after the SELECT clause.
* LIMIT/OFFSET: The LIMIT and OFFSET clauses limit the number of rows returned by the query. They are executed last, after all other clauses have been executed.