Database Approach advantages and disadvantages

Advantages –

- Better data transferring.
- Better data security.
- Minimized data inconsistency.
- Data sharing.
- Improved data security.

Disadvantages –

- Increased cost.
- Complexity.
- Database failure.
- Frequent updates/ upgrades.

Three – tier architecture of a DBMS

1. Internal level – Structures and access paths.
2. Conceptual level – Structure and constraints.
3. External level – Various user views.

Data independence

1. Logical data independence. – Change conceptual without effecting external.
2. Physical data independence. – change internal without effecting conceptual.

LIKE operator in SQL

- 'a%' – Starts with 'a'.
- '%a%' – Containing letter 'a'.
- '%a' – Ends with 'a'.
- 'a%b' – Starts with 'a' ends with 'b'.
- 'Sri-Lanka' – (without wildcard)

```
SELECT * FROM Customers
WHERE Country LIKE 'Spain';
```

Return all customers from sri-lanka.

INSERT operator in SQL

```sql
INSERT INTO table_name (column1, column2, column3, ...)
VALUES (value1, value2, value3, ...);
```

UPDATE operator in SQL.

```sql
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;
```

DELETE operator in SQL

```sql
DELETE FROM table_name WHERE condition;
```

IN operator in SQL

```sql
SELECT column_name(s)
FROM table_name
WHERE column_name IN (value1, value2, ...);
```

Ex –

```sql
SELECT * FROM Customers
WHERE Country IN ('Germany', 'France', 'UK');
```

Return all customers from ('Germany', 'France', 'UK')

BETWEEN operator in SQL

```sql
SELECT column_name(s)
FROM table_name
WHERE column_name BETWEEN value1 AND value2;
```

Ex-

```sql
SELECT * FROM Products
WHERE Price BETWEEN 10 AND 20;
```

Return all products with a price between 10 and 20.

"Quaternary Relationship" – Four Participating entities.

"Ternary Relationship" – Three participating entities.

GROUP BY in SQL

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
ORDER BY column_name(s);
```

Ex-

```
SELECT COUNT(CustomerID), Country
FROM Customers
GROUP BY Country
ORDER BY COUNT(CustomerID) DESC;
```

Return number of customers in each country, sorted high to low

COUNT()

```
SELECT COUNT(column_name)
FROM table_name
WHERE condition;
```

Counts the values of the given column name In the brackets.

MIN() and MAX()

```
SELECT MIN (column_name)
FROM table_name
WHERE condition;
```

```
SELECT MAX(column_name)
FROM table_name
WHERE condition;
```

Return lowest or highest value of the given column name in the brackets.

HAVING operator in SQL

```sql
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
HAVING condition
ORDER BY column_name(s);
```

Having clause is added to SQL because where keyword cant be used with aggregate functions (group by, order by).

ORDER BY operator in SQL

```sql
SELECT column1, column2, ...
FROM table_name
ORDER BY column1, column2, ... ASC|DESC;
```

ASC – Ascending order.

DESC – Descending order.

SELECT operator in SQL

```sql
SELECT column1, column2, ...
FROM table_name;
```

Displays the column1 and column2.

DISTINCT operator in SQL

```sql
SELECT DISTINCT column1, column2, ...
FROM table_name;
```

Ex –

```sql
SELECT DISTINCT Country FROM Customers;
```

Select all the different countries from the "Customers" table.

<u>Expert Systems.</u>

- Is a computer system emulating the decision-making ability of a human expert.
- Based on AI technology.
- Represent the knowledge and decision-making skills of specialist.

<u>Enterprise System.</u>

- Defined as the large complex computing systems which handle large volumes of data and enable organizations to integrate and coordinate their business processes.
- Support the business processes across any functional boundaries that exist within the organization.
- Use internet technology.
- Main elements – ERP, CRM, SCM and SRM.

<u>Office Automation Systems</u>

- Used to manage the administrative functions in an office an office environment.
- Intended to increase the productivity of office workers.

Database Management System

- Software systems used to store, retrieve, and run queries on data.
- Supports in managing the data in the database.
- Is a collection of programs that enables users to create and maintain a database.
- Ease of access

Relational Database Management System

- Database management systems like SQL, MS SQL server are based on the 'relational model'.
- It supports the storage of real world data as 'Entities'.
- Introduced by E. F. Codd.
- Relational databases work on tables which has a 'key' field that uniquely indicates each row of the table.

DCL(Data Control Language) – Consists of statements that control security and concurrent access to table data.

DDL(Data Definition Language) – commands to define storage groups, different structures and objects in a database.

- CREATE
- ALTER
- DROP
- UNIQUE
- PRIMARY
- FOREIGN KEY
- CHECK

DML(Data Manipulation Language) – is a computer programming language for adding, deleting, modifying data in a database.

- SELECT
- INSERT
- UPDATE
- DELETE