SQL SCENARIO BASED QUESTIONS PART-18

Scenario: Handling deletion of related rows with foreign keys

Question: How can you ensure that when a department is deleted, all employees in that department are also deleted?

The ON DELETE CASCADE clause ensures that child rows (employees) are automatically deleted when the parent row (department) is deleted.

For Example:

```
CREATE TABLE employees (
    employee_id INT PRIMARY KEY,
    department_id INT,
    FOREIGN KEY (department_id) REFERENCES departments(department_id) ON
DELETE CASCADE
);
```

Now, if a department is removed from the departments table, all employees assigned to that department will also be deleted automatically.

Scenario: Creating a clustered index on a primary key column

Question: How would you create a clustered index on the employee_id column of the employees table?

A clustered index determines the physical storage order of the rows based on the indexed column. Typically, a primary key is a clustered index by default, but it can be explicitly created as well.

For Example:

```
CREATE CLUSTERED INDEX idx_employee_id ON employees (employee_id);
```

Resulting Table:

The rows in the employees table are now stored in the order of employee_id.

Scenario: Adding a non-clustered index to improve query performance

Question: How can you create a non-clustered index on the last_name column to speed up queries?

A non-clustered index improves search performance without altering the physical order of the data. It provides pointers to the actual data location.

For Example:

```
CREATE NONCLUSTERED INDEX idx_last_name ON employees (last_name);
```

Now, searches on last_name will be faster, as the database uses the index for
lookups.

Scenario: Preventing duplicate values in a column

Question: How can you ensure that the email column in the employees table contains unique values only?

The UNIQUE constraint ensures that no duplicate values are entered into the email column.

For Example:

```
ALTER TABLE employees
ADD CONSTRAINT unique_email UNIQUE (email);
```

Resulting Table Structure:

employee_id	first_name	last_name	email
INT (PK)	VARCHAR(50)	VARCHAR(50)	VARCHAR(100)

Each email value must be unique across all rows.

Scenario: Dropping an index from a table

Question: How do you drop an index named idx_last_name from the employees table?

The DROP INDEX statement is used to remove an index when it is no longer needed, freeing up space and reducing maintenance overhead.

For Example:

```
DROP INDEX idx_last_name ON employees;
```

After this command, the index on last_name is removed, potentially slowing down
queries that rely on it.

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