Table, Insert, Select, Update, Delete and Upsert

Psql commands

psql is a terminal-based front-end to PostgreSQL. It enables you to type in queries interactively, issue them to PostgreSQL, and see the query results.

- `\d table_name -> shows metadata of a table`
- `\dt -> shows tables list of connected database`

Tables

The data in an RDBMS is stored in database objects which are called as tables. This table is basically a collection of related data entries and it consists of numerous columns and rows.

- **Rows per table - 4,294,967,295**
- **columns per table - 1600**

limits

	Baseball	Basketball	Football	Total
Male	13	15	20	48
Female	23	16	13	52
Total	36	31	33	100

PostgreSQL Table Structure

```
CREATE TABLE [IF NOT EXISTS] table_name (
   column1 datatype(length) column_constraint,
   column2 datatype(length) column_constraint,
   column3 datatype(length) column_constraint,
   table_constraints
);
```

Constraints

- **NOT NULL** – ensures that values in a column cannot be NULL.
- **UNIQUE** – ensures the values in a column unique across the rows within the same table.
- **PRIMARY KEY** – a primary key column uniquely identify rows in a table. A table can have one and only one primary key. The primary key constraint allows you to define the primary key of a table.
- **CHECK** – a CHECK constraint ensures the data must satisfy a boolean expression.
- **FOREIGN KEY** – ensures values in a column or a group of columns from a table exists in a column or group of columns in another table. Unlike the primary key, a table can have many foreign keys

INSERT statement

Insert is a widely-used command in **data manipulation language** (**DML**) used by relational databases. The insert command is used for **inserting one** or **more rows** into a database table with specified table column values.

```
INSERT INTO table_name(column1, column2, …) VALUES (value1, value2, …);  RETURNING column1, column2…
```

```
INSERT INTO table_name (column_list) VALUES
    (value_list_1),
    (value_list_2),
    ...
    (value_list_n)
RETURNING * | output_expression as new_name;
```

SELECT statement

Select command is used to fetch the data in a set of records from a **table**, **view** or a **group of tables**, **views** by making use of SQL **joins**. Retrieval of data using SQL statements can be done by using different predicates like − **Where**. **Group By**. **Having.**

```
SELECT [ ALL | DISTINCT | DISTINCT ON (distinct_expressions) ]
expressions
FROM tables
[WHERE conditions]
[GROUP BY expressions]
[HAVING condition]
[ORDER BY expression [ ASC | DESC | USING operator ] [ NULLS FIRST | NULLS LAST ]]
[LIMIT [ number_rows | ALL]
[OFFSET offset_value [ ROW | ROWS ]]
[FETCH { FIRST | NEXT } [ fetch_rows ] { ROW | ROWS } ONLY]
[FOR { UPDATE | SHARE } OF table [ NOWAIT ]];
```

UPDATE statement

Update command is a **data manipulation command (DML)** which is used to edit the records of a table. It may be used to update a single row based on a condition, all rows or set of rows based on the condition given by the user.

```
UPDATE table_name
SET column1 = value1,
column2 = value2,
    …
WHERE condition
RETURNING * | output_expression AS output_name;
```

DELETE statement

Delete command is a **data manipulation command(DML)** which is used to remove records from a table. All records may be removed in one go, or a set of records may be deleted based on a condition.

```
DELETE FROM table_name
WHERE condition
RETURNING (select_list | *)
```

UPSERT statement

The term upsert is a portmanteau – a combination of the words “update” and “insert.” In the context of relational databases, an upsert is a database operation that will update an existing row if a specified value already exists in a table, and insert a new row if the specified value doesn't already exist.

```
INSERT INTO table_name(column_list)
VALUES(value_list)
ON CONFLICT target action;
```

- **target**
  - (column_name) - a column name.
  - ON CONSTRAINT constraint_name - where the constraint name could be the name of the UNIQUE constraint.
  - WHERE predicate - a WHERE clause with a predicate.
- **action**
  - **DO NOTHING** means do nothing if the row already exists in the table.
  - **DO UPDATE SET** column_1 = value_1, .. WHERE condition - update some fields in the table.

Interview Questions