PostgreSQL Constraints

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Constraints are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the table. If there is any violation between the constraint and the data action, the action is aborted. Constraints can be column level or table level.

- Primary key
- Foreign key
- Check constraint
- Unique constraint
- Not null constraint

Primary key

A primary key is a column or a set of columns in a table whose values uniquely identify a row in the table. A relational database is designed to enforce the uniqueness of primary keys by allowing only one row with a given primary key value in a table.

```
...
PRIMARY KEY (column_1, column_2)
...
```

Foreign key

A **foreign key** is a column or columns of data in one table that refers to the unique data values (often the primary key data) in another table. Foreign keys link together two or more tables in a relational database.

```
[CONSTRAINT fk_name]
   FOREIGN KEY(fk_columns)
   REFERENCES parent_table(parent_key_columns)
   [ON DELETE action]
   [ON UPDATE action]
```

- SET NULL
- SET DEFAULT
- RESTRICT
- NO ACTION
- CASCADE

```
ALTER TABLE <table_name>
ADD CONSTRAINT <constraint_name> FOREIGN KEY(<fk_columns>)
    REFERENCES <parent_table>(<parent_tale_columns>)
    [ON DELETE <action>]
    [ON UPDATE <action>];
```

Check constraint

The **CHECK constraint** is used to limit the value range that can be placed in a column. If you define a CHECK constraint on a column it will allow only certain values for this column. If you define a CHECK constraint on a table it can limit the values in certain columns based on values in other columns in the row.

- `column_name data_type CHECK(...)  /* {table}_{column}_check */`
- `column_name data_type CONSTRAINT constraint_name CHECK(...)`

- ```
  ALTER TABLE employee
      ADD CONSTRAINT constraint_name CHECK (condition1),
      ADD CONSTRAINT constraint_name CHECK (condition2);
  ```
  ```

Unique constraint(Unique Key)

A Unique Key is used to prevent duplicate values in a column. Primary Key provided uniqueness to a table.

```
ALTER TABLE table_name ADD CONSTRAINT constraint_name UNIQUE(column1,column2,..);
```

NOT NULL constraint

The **NOT NULL constraint** is used to ensure that a given column of a table is never assigned the null value. Once a NOT NULL constraint has been defined for a particular column, any insert or update operation that attempts to place a null value in that column will fail.

```
ALTER TABLE table_name ALTER COLUMN column_name SET NOT NULL;
```

Interview Questions