

Constraints in Postgres

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Dad Joke to break the ice:

What is the difference between a
Bird and a Fly?

- ▶ This is a joke that has been going around the office and made me think it is an excellent joke to start a talk about constraints.

A Bird can fly but a Fly can't bird



What constraints can do for you!

- ▶ First line of defence for the integrity of your database
- ▶ A wise man once said: "Data must protect itself!". And this is what constraints can help you do.
- ▶ It is easier to add a lot of constraints at the start of a project than to find out that data is incorrect.



Manipulating Constraint

- ▶ Can be added when you create the table
- ▶ Or after using the ALTER TABLE Command
- ▶ You can remove a constraint with:

```
ALTER TABLE products DROP CONSTRAINT some_name  
or
```

```
ALTER TABLE products ALTER COLUMN product_no DROP NOT NULL
```

- ▶ You can not rename a constraint DROP and recreate instead.

Constraint types

- ▶ NOT NULL
- ▶ UNIQUE
- ▶ PRIMARY Key
- ▶ FOREIGN Key
- ▶ CHECK
- ▶ EXCLUSION

- ▶ Bonus

NOT NULL Constraint

By default, a column can hold NULL values. If you do not want a column to have a NULL value, then you need to define such constraint on this column specifying that NULL is now not allowed for that column. A NOT NULL constraint is always written as a column constraint.

UNIQUE Constraint

The UNIQUE Constraint prevents two records from having identical values in a particular column.

PRIMARY Key

The PRIMARY KEY constraint uniquely identifies each record in a database table. There can be more UNIQUE columns, but only one primary key in a table. Primary keys are important when designing the database tables. Primary keys are unique ids.

We use them to refer to table rows. Primary keys become foreign keys in other tables, when creating relations among tables.

A primary key is a field in a table, which uniquely identifies each row/record in a database table. Primary keys must contain unique values. A primary key column cannot have NULL values.

A table can have only one primary key, which may consist of single or multiple fields. When multiple fields are used as a primary key, they are called a composite key.

FOREIGN KEY

A foreign key constraint specifies that the values in a column (or a group of columns) must match the values appearing in some row of another table. We say this maintains the referential integrity between two related tables. They are called foreign keys because the constraints are foreign; that is, outside the table. Foreign keys are sometimes called a referencing key.

CHECK Constraint

The CHECK Constraint enables a condition to check the value being entered into a record. If the condition evaluates to false, the record violates the constraint and is not entered into the table.

EXCLUSION Constraints

Exclusion constraints ensure that if any two rows are compared on the specified columns or expressions using the specified operators, at least one of these operator comparisons will return false or null.

- `CREATE TABLE b (p PERIOD);`
- `ALTER TABLE b ADD EXCLUDE USING gist (p WITH &&);`
- `INSERT INTO b VALUES('[2009-01-05, 2009-01-10]');`
- `INSERT INTO b VALUES('[2009-01-07, 2009-01-12]');` -- causes ERROR

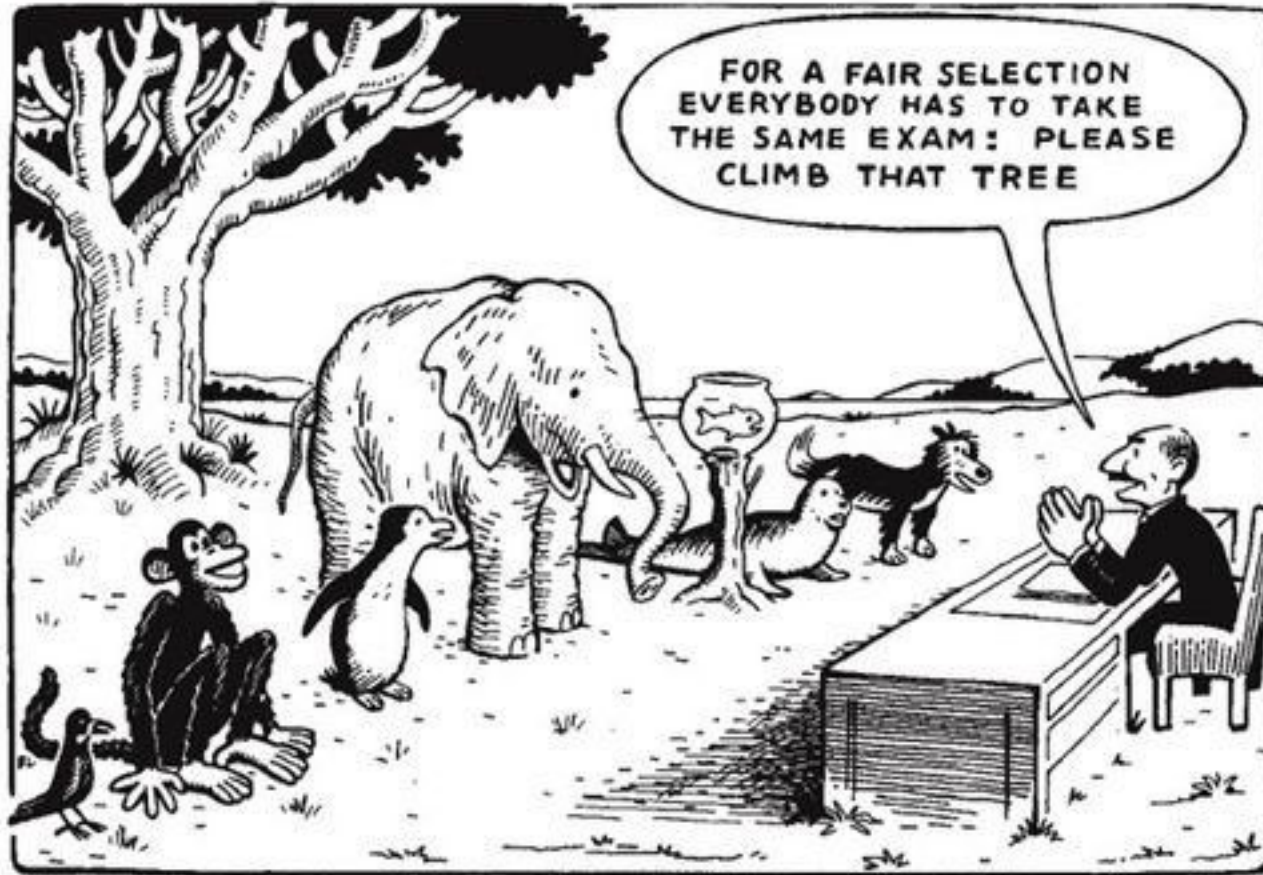
Constraint triggers

```
CREATE [ CONSTRAINT ] TRIGGER name { BEFORE | AFTER | INSTEAD  
OF } { event [ OR ... ] }  
    ON table_name  
    [ FROM referenced_table_name ]  
    [ NOT DEFERRABLE | [ DEFERRABLE ] [ INITIALLY IMMEDIATE | INITIALLY  
DEFERRED ] ]  
    [ FOR [ EACH ] { ROW | STATEMENT } ]  
    [ WHEN ( condition ) ]  
    EXECUTE PROCEDURE function_name ( arguments )
```

Constraints on jsonb field

- In PostgreSQL, keys and constraints can be defined on both regular columns and directly on any expression, as long as that expression is immutable
- `CREATE TABLE jsontable (j jsonb NOT NULL)`
- `CREATE UNIQUE INDEX j_uuid_idx ON jsontable(((j->>'uuid')::uuid));`
- `ALTER TABLE jsontable ADD CONSTRAINT uuid_must_exist CHECK (j ? 'uuid');`

Questions



Thank You