

# SQL CONSTRAINTS & TRIGGERS

## 1) Check constraint

**CHECK** (conditional-expression)

↳ Update/insertion is rejected if the condition does not evaluate to TRUE

→ e.g. CREATE TABLE Invoices (

invid INTEGER PRIMARY KEY,

ordid INTEGER NOT NULL UNIQUE,

amount NUMERIC(8,2) CHECK (amount > 0), ↳ Can be used inline

issued DATE,

due DATE,

CHECK (ordid IN SELECT ordid FROM Orders), ↳ SQL allows queries in CHECK, but this is not implemented in PostgreSQL

CHECK (due >= issued));

↳ Similar to foreign key constraint, but not the same:

→ This check constraint doesn't enforce ordid to be a key for Orders.

→ This check constraint will fail w/ NULLs

## 2) Domain constraint

CREATE DOMAIN name datatype [DEFAULT value] [constraint]

where constraint can be NOT NULL or CHECK (expression)

↳ A domain is essentially a data type w/ optional constraints

→ e.g. CREATE DOMAIN posnumber NUMERIC(10, 2)

CHECK (VALUE > 0);

↳ refers to the value being tested

e.g. CREATE DOMAIN category VARCHAR(20)

CHECK (VALUE IN ('BOOK', 'MUSIC', 'MOVIE'));

↳ value can only be one of these strings

→ After creating the domain, we can use it as follows:

CREATE TABLE R (

a posnumber,

b category);

If we try inserting:

INSERT INTO R

VALUES (-1, 'movie')

→ Gives an error!

value for domain posnumber violates check constraint

Strings are case sensitive, so value for domain category violates check constraint

→ It behaves like a new data type w/ the additional constraint,

↳ can avoid repeating check constraints



### 3) Assertions

→ are check constraints that are not bound to a specific table

```
CREATE ASSERTION name CHECK (condition)
```

e.g. CREATE ASSERTION too-many-customers

CHECK ((SELECT COUNT(\*) FROM Customers) <= 1000);

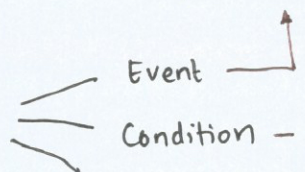
↳ Not implemented in any of the currently available DBMS,  
again the problem is allowing subqueries in CHECK (Not the create assertion)

### TRIGGERS

→ specify an action to execute if certain events take place

↓  
a change to the database that activates the trigger  
(an insertion/deletion/update)

→ 3 components:

- Event 
- Condition — a query/test checked when trigger is activated
- Action — a procedure executed when condition is true
  - ↳ Can refer to old/new values of modified tuples
  - ↳ Can examine answers to the condition query
  - ↳ Can execute new queries
  - ↳ Can make changes to the database
  - ↳ Can be executed before/after the event for each row/for each statement