



## QUERYING DATA FROM A TABLE

```
SELECT c1, c2 FROM t;
```

Query data in columns c1, c2 from a table

```
SELECT * FROM t;
```

Query all rows and columns from a table

```
SELECT c1, c2 FROM t
```

```
WHERE condition;
```

Query data and filter rows with a condition

```
SELECT DISTINCT c1 FROM t
```

```
WHERE condition;
```

Query distinct rows from a table

```
SELECT c1, c2 FROM t
```

```
ORDER BY c1 ASC [DESC];
```

Sort the result set in ascending or descending order

```
SELECT c1, c2 FROM t
```

```
ORDER BY c1
```

```
LIMIT n OFFSET offset;
```

Skip *offset* of rows and return the next n rows

```
SELECT c1, aggregate(c2)
```

```
FROM t
```

```
GROUP BY c1;
```

Group rows using an aggregate function

```
SELECT c1, aggregate(c2)
```

```
FROM t
```

```
GROUP BY c1
```

```
HAVING condition;
```

Filter groups using HAVING clause

## QUERYING FROM MULTIPLE TABLES

```
SELECT c1, c2
```

```
FROM t1
```

```
INNER JOIN t2 ON condition;
```

Inner join t1 and t2

```
SELECT c1, c2
```

```
FROM t1
```

```
LEFT JOIN t2 ON condition;
```

Left join t1 and t2

```
SELECT c1, c2
```

```
FROM t1
```

```
RIGHT JOIN t2 ON condition;
```

Right join t1 and t2

```
SELECT c1, c2
```

```
FROM t1
```

```
FULL OUTER JOIN t2 ON condition;
```

Perform full outer join

```
SELECT c1, c2
```

```
FROM t1
```

```
CROSS JOIN t2;
```

Produce a Cartesian product of rows in tables

```
SELECT c1, c2
```

```
FROM t1, t2;
```

Another way to perform cross join

```
SELECT c1, c2
```

```
FROM t1 A
```

```
INNER JOIN t2 B ON condition;
```

Join t1 to itself using INNER JOIN clause

## USING SQL OPERATORS

```
SELECT c1, c2 FROM t1
```

```
UNION [ALL]
```

```
SELECT c1, c2 FROM t2;
```

Combine rows from two queries

```
SELECT c1, c2 FROM t1
```

```
INTERSECT
```

```
SELECT c1, c2 FROM t2;
```

Return the intersection of two queries

```
SELECT c1, c2 FROM t1
```

```
EXCEPT
```

```
SELECT c1, c2 FROM t2;
```

Subtract a result set from another result set

```
SELECT c1, c2 FROM t1
```

```
WHERE c1 [NOT] LIKE pattern;
```

Query rows using pattern matching %, \_

```
SELECT c1, c2 FROM t
```

```
WHERE c1 [NOT] IN value_list;
```

Query rows in a list

```
SELECT c1, c2 FROM t
```

```
WHERE c1 BETWEEN low AND high;
```

Query rows between two values

```
SELECT c1, c2 FROM t
```

```
WHERE c1 IS [NOT] NULL;
```

Check if values in a table is NULL or not



## MANAGING TABLES

```
CREATE TABLE t (  
  id SERIAL PRIMARY KEY,  
  name VARCHAR NOT NULL,  
  price NUMERIC(10,2) DEFAULT 0  
);
```

Create a new table with three columns

```
DROP TABLE t CASCADE;
```

Delete the table from the database

```
ALTER TABLE t ADD column;
```

Add a new column to the table

```
ALTER TABLE t DROP COLUMN c ;
```

Drop column c from the table

```
ALTER TABLE t ADD constraint;
```

Add a constraint

```
ALTER TABLE t DROP constraint;
```

Drop a constraint

```
ALTER TABLE t1 RENAME TO t2;
```

Rename a table from t1 to t2

```
ALTER TABLE t1 RENAME c1 TO c2 ;
```

Rename column c1 to c2

```
TRUNCATE TABLE t CASCADE;
```

Remove all data in a table

## USING SQL CONSTRAINTS

```
CREATE TABLE t(  
  c1 INT, c2 INT, c3 VARCHAR,  
  PRIMARY KEY (c1,c2)  
);
```

Set c1 and c2 as a primary key

```
CREATE TABLE t1(  
  c1 SERIAL PRIMARY KEY,  
  c2 INT,  
  FOREIGN KEY (c2) REFERENCES t2(c2)  
);
```

Set c2 column as a foreign key

```
CREATE TABLE t(  
  c1 INT, c1 INT,  
  UNIQUE(c2,c3)  
);
```

Make the values in c1 and c2 unique

```
CREATE TABLE t(  
  c1 INT, c2 INT,  
  CHECK(c1 > 0 AND c1 >= c2)  
);
```

Ensure c1 > 0 and values in c1 >= c2

```
CREATE TABLE t(  
  c1 SERIAL PRIMARY KEY,  
  c2 VARCHAR NOT NULL  
);
```

Set values in c2 column not NULL

## MODIFYING DATA

```
INSERT INTO t(column_list)  
VALUES(value_list);
```

Insert one row into a table

```
INSERT INTO t(column_list)  
VALUES (value_list,  
        (value_list), ...);
```

Insert multiple rows into a table

```
INSERT INTO t1(column_list)  
SELECT column_list  
FROM t2;
```

Insert rows from t2 into t1

```
UPDATE t  
SET c1 = new_value;
```

Update new value in the column c1 for all rows

```
UPDATE t  
SET c1 = new_value,  
    c2 = new_value  
WHERE condition;
```

Update values in the column c1, c2 that match the condition

```
DELETE FROM t;
```

Delete all data in a table

```
DELETE FROM t  
WHERE condition;
```

Delete subset of rows in a table



## MANAGING VIEWS

---

```
CREATE VIEW v(c1,c2)
AS
SELECT c1, c2
FROM t;
```

Create a new view that consists of c1 and c2

```
CREATE VIEW v(c1,c2)
AS
SELECT c1, c2
FROM t;
WITH [CASCADED | LOCAL] CHECK OPTION;
```

Create a new view with check option

```
CREATE RECURSIVE VIEW v
AS
select-statement -- anchor part
UNION [ALL]
select-statement; -- recursive part
```

Create a recursive view

```
CREATE TEMPORARY VIEW v
AS
SELECT c1, c2
FROM t;
```

Create a temporary view

```
DROP VIEW view_name;
```

Delete a view

## MANAGING INDEXES

---

```
CREATE INDEX idx_name
ON t(c1,c2);
```

Create an index on c1 and c2 of the table t

```
CREATE UNIQUE INDEX idx_name
ON t(c3,c4);
```

Create a unique index on c3, c4 of the table t

```
DROP INDEX idx_name;
```

Drop an index

## SQL AGGREGATE FUNCTIONS

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**AVG** returns the average of a list

**COUNT** returns the number of elements of a list

**SUM** returns the total of a list

**MAX** returns the maximum value in a list

**MIN** returns the minimum value in a list

## MANAGING TRIGGERS

---

```
CREATE OR MODIFY TRIGGER trigger_name
WHEN EVENT
ON table_name TRIGGER_TYPE
EXECUTE stored_procedure;
```

Create or modify a trigger

### WHEN

- **BEFORE** – invoke before the event occurs
- **AFTER** – invoke after the event occurs

### EVENT

- **INSERT** – invoke for INSERT
- **UPDATE** – invoke for UPDATE
- **DELETE** – invoke for DELETE

### TRIGGER\_TYPE

- **FOR EACH ROW**
- **FOR EACH STATEMENT**

```
CREATE TRIGGER before_insert_person
BEFORE INSERT
ON person FOR EACH ROW
EXECUTE stored_procedure;
```

Create a trigger invoked before a new row is inserted into the person table

```
DROP TRIGGER trigger_name;
```

Delete a specific trigger