



## 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

[see list of aggregators on p.3](#)

**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 t1

**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**

**MINUS**

**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 %, \_

% 0 or more chars

\_ any single chars

**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 INT PRIMARY KEY,  
  name VARCHAR NOT NULL,  
  price INT DEFAULT 0  
);
```

Create a new table with three columns

```
DROP TABLE t;
```

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;
```

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 INT 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 INT 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

**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