```
Use testdb;
CREATE TABLE employee (
 emp_id INT PRIMARY KEY,
 first_name VARCHAR(40),
 last_name VARCHAR(40),
 birth_day DATE,
 sex VARCHAR(1),
 salary INT,
 super_id INT,
 branch_id INT
);

CREATE TABLE branch (
 branch_id INT PRIMARY KEY,
 branch_name VARCHAR(40),
 mgr_id INT,
 mgr_start_date DATE,
 FOREIGN KEY(mgr_id) REFERENCES employee(emp_id) ON DELETE SET NULL
);
```

Note-We can also define ON DELETE SET cascade

```
ALTER TABLE employee

ADD FOREIGN KEY(branch_id)

REFERENCES branch(branch_id)

ON DELETE SET NULL;


ALTER TABLE employee

ADD FOREIGN KEY(super_id)

REFERENCES employee(emp_id)

ON DELETE SET NULL;


CREATE TABLE client (

 client_id INT PRIMARY KEY,

 client_name VARCHAR(40),

 branch_id INT,

 FOREIGN KEY(branch_id) REFERENCES branch(branch_id) ON DELETE SET NULL

);


CREATE TABLE works_with (
```

```
  emp_id INT,
  client_id INT,
  total_sales INT,
  PRIMARY KEY(emp_id, client_id),
  FOREIGN KEY(emp_id) REFERENCES employee(emp_id) ON DELETE CASCADE,
  FOREIGN KEY(client_id) REFERENCES client(client_id) ON DELETE CASCADE
);

CREATE TABLE branch_supplier (
  branch_id INT,
  supplier_name VARCHAR(40),
  supply_type VARCHAR(40),
  PRIMARY KEY(branch_id, supplier_name),
  FOREIGN KEY(branch_id) REFERENCES branch(branch_id) ON DELETE CASCADE
);

-- ---------------------------------------------------------------------------

-- Corporate
INSERT INTO employee VALUES(100, 'David', 'Wallace', '1967-11-17', 'M', 250000, NULL, NULL);

INSERT INTO branch VALUES(1, 'Corporate', 100, '2006-02-09');

UPDATE employee
SET branch_id = 1
WHERE emp_id = 100;

INSERT INTO employee VALUES(101, 'Jan', 'Levinson', '1961-05-11', 'F', 110000, 100, 1);

-- Scranton
INSERT INTO employee VALUES(102, 'Michael', 'Scott', '1964-03-15', 'M', 75000, 100, NULL);

INSERT INTO branch VALUES(2, 'Scranton', 102, '1992-04-06');
```

```
UPDATE employee
SET branch_id = 2
WHERE emp_id = 102;

INSERT INTO employee VALUES(103, 'Angela', 'Martin', '1971-06-25', 'F', 63000, 102, 2);
INSERT INTO employee VALUES(104, 'Kelly', 'Kapoor', '1980-02-05', 'F', 55000, 102, 2);
INSERT INTO employee VALUES(105, 'Stanley', 'Hudson', '1958-02-19', 'M', 69000, 102, 2);

-- Stamford
INSERT INTO employee VALUES(106, 'Josh', 'Porter', '1969-09-05', 'M', 78000, 100, NULL);

INSERT INTO branch VALUES(3, 'Stamford', 106, '1998-02-13');

UPDATE employee
SET branch_id = 3
WHERE emp_id = 106;

INSERT INTO employee VALUES(107, 'Andy', 'Bernard', '1973-07-22', 'M', 65000, 106, 3);
INSERT INTO employee VALUES(108, 'Jim', 'Halpert', '1978-10-01', 'M', 71000, 106, 3);


-- BRANCH SUPPLIER
INSERT INTO branch_supplier VALUES(2, 'Hammer Mill', 'Paper');
INSERT INTO branch_supplier VALUES(2, 'Uni-ball', 'Writing Utensils');
INSERT INTO branch_supplier VALUES(3, 'Patriot Paper', 'Paper');
INSERT INTO branch_supplier VALUES(2, 'J.T. Forms & Labels', 'Custom Forms');
INSERT INTO branch_supplier VALUES(3, 'Uni-ball', 'Writing Utensils');
INSERT INTO branch_supplier VALUES(3, 'Hammer Mill', 'Paper');
INSERT INTO branch_supplier VALUES(3, 'Stamford Lables', 'Custom Forms');

-- CLIENT
INSERT INTO client VALUES(400, 'Dunmore Highschool', 2);
```

```
INSERT INTO client VALUES(401, 'Lackawana Country', 2);

INSERT INTO client VALUES(402, 'FedEx', 3);

INSERT INTO client VALUES(403, 'John Daly Law, LLC', 3);

INSERT INTO client VALUES(404, 'Scranton Whitepages', 2);

INSERT INTO client VALUES(405, 'Times Newspaper', 3);

INSERT INTO client VALUES(406, 'FedEx', 2);



-- WORKS_WITH

INSERT INTO works_with VALUES(105, 400, 55000);

INSERT INTO works_with VALUES(102, 401, 267000);

INSERT INTO works_with VALUES(108, 402, 22500);

INSERT INTO works_with VALUES(107, 403, 5000);

INSERT INTO works_with VALUES(108, 403, 12000);

INSERT INTO works_with VALUES(105, 404, 33000);

INSERT INTO works_with VALUES(107, 405, 26000);

INSERT INTO works_with VALUES(102, 406, 15000);

INSERT INTO works_with VALUES(105, 406, 130000);
```

```
SELECT * FROM employee;
```

←T→				emp_id	first_name	last_name	birth_day	sex	salary	super_id	branch_id
☐	Edit	Copy	Delete	100	David	Wallace	1967-11-17	M	250000	*NULL*	1
☐	Edit	Copy	Delete	101	Jan	Levinson	1961-05-11	F	110000	100	1
☐	Edit	Copy	Delete	102	Michael	Scott	1964-03-15	M	75000	100	2
☐	Edit	Copy	Delete	103	Angela	Martin	1971-06-25	F	63000	102	2
☐	Edit	Copy	Delete	104	Kelly	Kapoor	1980-02-05	F	55000	102	2

←T→			emp_id	first_name	last_name	birth_day	sex	salary	super_id	branch_id
Edit	Copy	Delete	105	Stanley	Hudson	1958-02-19	M	69000	102	2
Edit	Copy	Delete	106	Josh	Porter	1969-09-05	M	78000	100	3
Edit	Copy	Delete	107	Andy	Bernard	1973-07-22	M	65000	106	3
Edit	Copy	Delete	108	Jim	Halpert	1978-10-01	M	71000	106	3

SELECT * FROM works_with;

←T→			emp_id	client_id	total_sales
Edit	Copy	Delete	102	401	267000
Edit	Copy	Delete	102	406	15000
Edit	Copy	Delete	105	400	55000
Edit	Copy	Delete	105	404	33000
Edit	Copy	Delete	105	406	130000
Edit	Copy	Delete	107	403	5000
Edit	Copy	Delete	107	405	26000
Edit	Copy	Delete	108	402	22500
Edit	Copy	Delete	108	403	12000

-- Find all employees ordered by salary

SELECT *

from employee

ORDER BY salary DESC;

←T→			emp_id	first_name	last_name	birth_day	sex	salary 1	super_id	branch_id
Edit	Copy	Delete	100	David	Wallace	1967-11-17	M	250000	*NULL*	1
Edit	Copy	Delete	101	Jan	Levinson	1961-05-11	F	110000	100	1
Edit	Copy	Delete	106	Josh	Porter	1969-09-05	M	78000	100	3
Edit	Copy	Delete	102	Michael	Scott	1964-03-15	M	75000	100	2
Edit	Copy	Delete	108	Jim	Halpert	1978-10-01	M	71000	106	3
Edit	Copy	Delete	105	Stanley	Hudson	1958-02-19	M	69000	102	2
Edit	Copy	Delete	107	Andy	Bernard	1973-07-22	M	65000	106	3
Edit	Copy	Delete	103	Angela	Martin	1971-06-25	F	63000	102	2
Edit	Copy	Delete	104	Kelly	Kapoor	1980-02-05	F	55000	102	2

-- Find all employees ordered by sex then name

SELECT *

from employee

ORDER BY sex, first_name,last_name;

emp_id	first_name	last_name	birth_day	sex	salary	super_id	branch_id
103	Angela	Martin	1971-06-25	F	63000	102 [->]	2 [->]
101	Jan	Levinson	1961-05-11	F	110000	100 [->]	1 [->]
104	Kelly	Kapoor	1980-02-05	F	55000	102 [->]	2 [->]
107	Andy	Bernard	1973-07-22	M	65000	106 [->]	3 [->]

emp_id	first_name	last_name	birth_day	sex	salary	super_id	branch_id
100	David	Wallace	1967-11-17	M	250000	*NULL*	1 [->]
108	Jim	Halpert	1978-10-01	M	71000	106 [->]	3 [->]
106	Josh	Porter	1969-09-05	M	78000	100 [->]	3 [->]
102	Michael	Scott	1964-03-15	M	75000	100 [->]	2 [->]
105	Stanley	Hudson	1958-02-19	M	69000	102 [->]	2 [->]

```
-- Find the first 5 employees in the table

SELECT *

from employee

LIMIT 5;
```

emp_id	first_name	last_name	birth_day	sex	salary	super_id	branch_id
100	David	Wallace	1967-11-17	M	250000	*NULL*	1 [->]
101	Jan	Levinson	1961-05-11	F	110000	100 [->]	1 [->]
102	Michael	Scott	1964-03-15	M	75000	100 [->]	2 [->]
103	Angela	Martin	1971-06-25	F	63000	102 [->]	2 [->]
104	Kelly	Kapoor	1980-02-05	F	55000	102 [->]	2 [->]

```
-- Find the first and last names of all employees

SELECT first_name, employee.last_name

FROM employee;
```

first_name	last_name
David	Wallace
Jan	Levinson
Michael	Scott
Angela	Martin
Kelly	Kapoor
Stanley	Hudson
Josh	Porter
Andy	Bernard

first_name	last_name
Jim	Halpert

-- Find the forename and surnames names of all employees

SELECT first_name AS forename, employee.last_name AS surname

FROM employee;

forename	surname
David	Wallace
Jan	Levinson
Michael	Scott
Angela	Martin
Kelly	Kapoor
Stanley	Hudson
Josh	Porter
Andy	Bernard
Jim	Halpert

-- Find out all the different genders

SELECT DISTINCT sex

FROM employee;

sex
M
F

-- Find all employee's id's and names who were born after 1969

SELECT emp_id, first_name, last_name

FROM employee

WHERE birth_day >= 1970-01-01;

emp_id	first_name	last_name
100	David	Wallace
101	Jan	Levinson
102	Michael	Scott
103	Angela	Martin
104	Kelly	Kapoor
105	Stanley	Hudson
106	Josh	Porter
107	Andy	Bernard
108	Jim	Halpert

-- Find all employees born between 1970 and 1975

SELECT *

FROM employee

WHERE birth_day BETWEEN '1970-01-01' AND '1975-01-01';

emp_id	first_name	last_name	birth_day	sex	salary	super_id	branch_id
103	Angela	Martin	1971-06-25	F	63000	102 [->]	2 [->]
107	Andy	Bernard	1973-07-22	M	65000	106 [->]	3 [->]

Function

-- Find the number of employees

SELECT COUNT(super_id)

FROM employee;

COUNT(super_id)
8

-- Find the average of all employee's salaries

SELECT AVG(salary)

FROM employee;

AVG(salary)
92888.8889

-- Find out how many males and females there are

SELECT COUNT(sex), sex

FROM employee

GROUP BY sex

COUNT(sex)	sex
3	F
6	M

-- Find the total sales of each salesman

SELECT SUM(total_sales), emp_id

FROM works_with

GROUP BY emp_id;

SUM(total_sales)	emp_id
282000	102 [->]
218000	105 [->]
31000	107 [->]
34500	108 [->]

WILDCARD

Wildcard is a specific pattern from which data is matches in table.

-- % = any number of characters, _ = one character

-- Find any client's who are an LLC

SELECT *

```
FROM client

WHERE client_name LIKE '%LLC';
```

client_id	client_name	branch_id
403	John Daly Law, LLC	3 [->]

```
-- Find any branch suppliers who are in the label business

SELECT *

FROM branch_supplier

WHERE supplier_name LIKE '% Label%';
```

branch_id	supplier_name	supply_type
2 [->]	J.T. Forms & Labels	Custom Forms

```
-- Find any employee born on the 10th day of the month

SELECT *

FROM employee

WHERE birth_day LIKE '____-10%';
```

emp_id	first_name	last_name	birth_day	sex	salary	super_id	branch_id
108	Jim	Halpert	1978-10-01	M	71000	106 [->]	3 [->]

```
-- Find any clients who are schools

SELECT *

FROM client

WHERE client_name LIKE '%Highschool%';
```

client_id	client_name	branch_id
400	Dunmore Highschool	2 [->]

UNION

```
-- Find a list of employee and branch names
SELECT employee.first_name AS Employee_Branch_Names
FROM employee
UNION
SELECT branch.branch_name
FROM branch;
```

Employee_Branch_Names
David
Jan
Michael
Angela
Kelly
Stanley
Josh
Andy
Jim
Corporate
Scranton
Stamford

```
-- Find a list of all clients & branch suppliers' names
SELECT client.client_name AS Non-Employee_Entities, client.branch_id AS Branch_ID
FROM client
UNION
SELECT branch_supplier.supplier_name, branch_supplier.branch_id
FROM branch_supplier;
-- Find a list of all clients & branch suppliers' names
SELECT client.client_name AS Non_Employee_Entities, client.branch_id AS Branch_ID
FROM client
```

```
UNION

SELECT branch_supplier.supplier_name, branch_supplier.branch_id

FROM branch_supplier;
```

Non_Employee_Entities	Branch_ID
Dunmore Highschool	2
Lackawana Country	2
FedEx	3
John Daly Law, LLC	3
Scranton Whitepages	2
Times Newspaper	3
FedEx	2
Hammer Mill	2
J.T. Forms & Labels	2
Uni-ball	2
Hammer Mill	3
Patriot Paper	3
Stamford Lables	3
Uni-ball	3

JOIN

```
-- Add the extra branch

INSERT INTO branch VALUES(4, "Buffalo", NULL, NULL);


SELECT employee.emp_id, employee.first_name, branch.branch_name

FROM employee

JOIN branch    -- LEFT JOIN, RIGHT JOIN

ON employee.emp_id = branch.mgr_id;
```

emp_id	first_name	branch_name
100	David	Corporate

emp_id	first_name	branch_name
102	Michael	Scranton
106	Josh	Stamford

```
SELECT employee.emp_id, employee.first_name, branch.branch_name
FROM employee
LEFT JOIN branch    -- LEFT JOIN, RIGHT JOIN
ON employee.emp_id = branch.mgr_id;
```

emp_id	first_name	branch_name
100	David	Corporate
102	Michael	Scranton
106	Josh	Stamford
101	Jan	*NULL*
103	Angela	*NULL*
104	Kelly	*NULL*
105	Stanley	*NULL*
107	Andy	*NULL*
108	Jim	*NULL*

NESTED QUERIES

```
-- Find names of all employees who have sold over 50,000
SELECT employee.first_name, employee.last_name
FROM employee
WHERE employee.emp_id IN (SELECT works_with.emp_id
                    FROM works_with
                    WHERE works_with.total_sales > 50000);
```

first_name	last_name
Michael	Scott
Stanley	Hudson

```
-- Find all clients who are handles by the branch that Michael Scott manages
-- Assume you know Michael's ID
SELECT client.client_id, client.client_name
FROM client
WHERE client.branch_id = (SELECT branch.branch_id
                    FROM branch
                    WHERE branch.mgr_id = 102
Limit  1);
```

client_id	client_name
400	Dunmore Highschool
401	Lackawana Country
404	Scranton Whitepages
406	FedEx

```
-- Find all clients who are handles by the branch that Michael Scott manages
 -- Assume you DONT'T know Michael's ID
 SELECT client.client_id, client.client_name
 FROM client
 WHERE client.branch_id = (SELECT branch.branch_id
                     FROM branch
                     WHERE branch.mgr_id = (SELECT employee.emp_id
                                 FROM employee
                                 WHERE employee.first_name = 'Michael' AND
employee.last_name ='Scott'
                                 LIMIT 1));
```

client_id	client_name
400	Dunmore Highschool
401	Lackawana Country

client_id	client_name
404	Scranton Whitepages
406	FedEx

```
use testdb;
SELECT client.client_name
FROM client
WHERE client.client_id IN (
                SELECT client_id
                FROM (
                    SELECT SUM(works_with.total_sales) AS totals, client_id
                    FROM works_with
                    GROUP BY client_id) AS total_client_sales
                WHERE totals > 100000
);
```

client_name
Lackawana Country
FedEx