

## 1. Creating database and table

```
mysql> create database CA3;use CA3;create table employees(emp_id int primary key,name varchar(50) not null,department varchar(50),salary decimal(10,2),join_date date);
Query OK, 1 row affected (0.02 sec)

Database changed
Query OK, 0 rows affected (0.02 sec)

mysql> desc employees;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| emp_id | int | NO | PRI | NULL | |
| name | varchar(50) | NO | | NULL | |
| department | varchar(50) | YES | | NULL | |
| salary | decimal(10,2) | YES | | NULL | |
| join_date | date | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.02 sec)
```

## Inserting data

```
mysql> insert into employees values(1,'Nimal Perera','IT', 75000.00,'2021-03-15'),(2,'Kamal Fernadno','HR',50000.00,'2020-06-10'),(3,'Saman Silva','Finance',60000.00,'2019-01-22'),(4,'Amara Jayasinghe','IT',80000.00,'2022-07-01'),(5,'Dilani Wickramasinghe','Marketing',45000.00,'2023-02-14'),(6,'Ruwan Senanayake','HR',55000.00,'2021-11-30'),(7,'Thilina Bandara','IT',70000.00,'2020-08-05');
Query OK, 7 rows affected (0.02 sec)
Records: 7 Duplicates: 0 Warnings: 0

mysql> select * from employees;
+-----+-----+-----+-----+-----+
| emp_id | name | department | salary | join_date |
+-----+-----+-----+-----+-----+
| 1 | Nimal Perera | IT | 75000.00 | 2021-03-15 |
| 2 | Kamal Fernadno | HR | 50000.00 | 2020-06-10 |
| 3 | Saman Silva | Finance | 60000.00 | 2019-01-22 |
| 4 | Amara Jayasinghe | IT | 80000.00 | 2022-07-01 |
| 5 | Dilani Wickramasinghe | Marketing | 45000.00 | 2023-02-14 |
| 6 | Ruwan Senanayake | HR | 55000.00 | 2021-11-30 |
| 7 | Thilina Bandara | IT | 70000.00 | 2020-08-05 |
+-----+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

i.

```
mysql> select name,department from employees where department="IT";
+-----+-----+
| name | department |
+-----+-----+
| Nimal Perera | IT |
| Amara Jayasinghe | IT |
| Thilina Bandara | IT |
+-----+-----+
3 rows in set (0.01 sec)
```

ii.

```
mysql> select avg(salary) as average_salary from employees;
+-----+
| average_salary |
+-----+
| 62142.857143 |
+-----+
1 row in set (0.01 sec)
```

iii.

```
mysql> select department,count(department) from employees group by department;
+-----+-----+
| department | count(department) |
+-----+-----+
| IT          | 3                 |
| HR          | 2                 |
| Finance     | 1                 |
| Marketing   | 1                 |
+-----+-----+
4 rows in set (0.00 sec)
```

iv.

```
mysql> select name,join_date from employees where join_date>2021-01-01;
+-----+-----+
| name          | join_date |
+-----+-----+
| Nimal Perera  | 2021-03-15 |
| Kamal Fernadno | 2020-06-10 |
| Saman Silva   | 2019-01-22 |
| Amara Jayasinghe | 2022-07-01 |
| Dilani Wickramasinghe | 2023-02-14 |
| Ruwan Senanayake | 2021-11-30 |
| Thilina Bandara | 2020-08-05 |
+-----+-----+
7 rows in set, 1 warning (0.00 sec)
```

v.

```
mysql> select max(salary) as max,min(salary) as min from employees;
+-----+-----+
| max      | min      |
+-----+-----+
| 80000.00 | 45000.00 |
+-----+-----+
1 row in set (0.00 sec)
```

vi.

```
mysql> select name,salary from employees order by salary desc;
+-----+-----+
| name          | salary |
+-----+-----+
| Amara Jayasinghe | 80000.00 |
| Nimal Perera     | 75000.00 |
| Thilina Bandara  | 70000.00 |
| Saman Silva      | 60000.00 |
| Ruwan Senanayake | 55000.00 |
| Kamal Fernadno   | 50000.00 |
| Dilani Wickramasinghe | 45000.00 |
+-----+-----+
7 rows in set (0.00 sec)
```

vii.

```
mysql> select distinct department from employees where salary < 60000;
+-----+
| department |
+-----+
| HR          |
| Marketing   |
+-----+
2 rows in set (0.00 sec)
```

viii.

```
mysql> select * from employees order by join_date desc;
+-----+-----+-----+-----+-----+
| emp_id | name                | department | salary  | join_date |
+-----+-----+-----+-----+-----+
| 5       | Dilani Wickramasinghe | Marketing | 45000.00 | 2023-02-14 |
| 4       | Amara Jayasinghe     | IT        | 80000.00 | 2022-07-01 |
| 6       | Ruwan Senanayake     | HR        | 55000.00 | 2021-11-30 |
| 1       | Nimal Perera         | IT        | 75000.00 | 2021-03-15 |
| 7       | Thilina Bandara      | IT        | 70000.00 | 2020-08-05 |
| 2       | Kamal Fernadno       | HR        | 50000.00 | 2020-06-10 |
| 3       | Saman Silva          | Finance   | 60000.00 | 2019-01-22 |
+-----+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

ix.

```
mysql> alter table employees modify salary int not null;
Query OK, 7 rows affected (0.06 sec)
Records: 7 Duplicates: 0 Warnings: 0

mysql> desc employees;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| emp_id     | int           | NO   | PRI | NULL    |       |
| name       | varchar(50)   | NO   |     | NULL    |       |
| department | varchar(50)   | YES  |     | NULL    |       |
| salary     | int           | NO   |     | NULL    |       |
| join_date  | date          | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

X.

```
mysql> select department,sum(salary) as total_salary from employees group by department order by total_salary desc;
```

department	total_salary
IT	225000
HR	105000
Finance	60000
Marketing	45000

```
4 rows in set (0.00 sec)
```

## 2. Creating project table

```
mysql> create table projects(project_id int primary key,emp_id int,project_name varchar(100) not null,project_budget decimal(10,2) not null,constraint pro_emp foreign key (emp_id) references employees(emp_id));
Query OK, 0 rows affected (0.04 sec)

mysql> desc projects;
```

Field	Type	Null	Key	Default	Extra
project_id	int	NO	PRI	NULL	
emp_id	int	YES	MUL	NULL	
project_name	varchar(100)	NO		NULL	
project_budget	decimal(10,2)	NO		NULL	

```
4 rows in set (0.00 sec)
```

### Inserting data

```
mysql> insert into projects values(101,1,'Payroll System',120000.00),(102,2,'Recruitment Portal',80000.00),(103,4,'Inventory App',95000.00),(104,7,'Help Desk System',70000.00),(105,5,'Marketing Automation',60000.00);
Query OK, 5 rows affected (0.02 sec)
Records: 5 Duplicates: 0 Warnings: 0

mysql> select * from projects;
```

project_id	emp_id	project_name	project_budget
101	1	Payroll System	120000.00
102	2	Recruitment Portal	80000.00
103	4	Inventory App	95000.00
104	7	Help Desk System	70000.00
105	5	Marketing Automation	60000.00

```
5 rows in set (0.00 sec)
```

A.

```
mysql> select employees.name,project_name from projects inner join employees on projects.emp_id=employees.emp_id where projects.project_budget<80000;
```

name	project_name
Thilina Bandara	Help Desk System
Dilani Wickramasinghe	Marketing Automation

```
2 rows in set (0.00 sec)
```

B.

```
mysql> select employees.name,projects.project_name from projects right join employees on projects.emp_id=employees.emp_id where projects.project_name like '%system%';
```

```
+-----+-----+
| name          | project_name |
+-----+-----+
| Nimal Perera   | Payroll System |
| Thilina Bandara | Help Desk System |
+-----+-----+
2 rows in set (0.00 sec)
```

C.

```
MySQL 8.0 Command Line Client
mysql> select * from projects cross join employees ;
```

project_id	emp_id	project_name	project_budget	emp_id	name	department	salary	join_date
105	5	Marketing Automation	60000.00	1	Nimal Perera	IT	75000	2021-03-15
104	7	Help Desk System	70000.00	1	Nimal Perera	IT	75000	2021-03-15
103	4	Inventory App	95000.00	1	Nimal Perera	IT	75000	2021-03-15
102	2	Recruitment Protal	80000.00	1	Nimal Perera	IT	75000	2021-03-15
101	1	Payroll System	120000.00	1	Nimal Perera	IT	75000	2021-03-15
105	5	Marketing Automation	60000.00	2	Kamal Fernadno	HR	50000	2020-06-10
104	7	Help Desk System	70000.00	2	Kamal Fernadno	HR	50000	2020-06-10
103	4	Inventory App	95000.00	2	Kamal Fernadno	HR	50000	2020-06-10
102	2	Recruitment Protal	80000.00	2	Kamal Fernadno	HR	50000	2020-06-10
101	1	Payroll System	120000.00	2	Kamal Fernadno	HR	50000	2020-06-10
105	5	Marketing Automation	60000.00	3	Saman Silva	Finance	60000	2019-01-22
104	7	Help Desk System	70000.00	3	Saman Silva	Finance	60000	2019-01-22
103	4	Inventory App	95000.00	3	Saman Silva	Finance	60000	2019-01-22
102	2	Recruitment Protal	80000.00	3	Saman Silva	Finance	60000	2019-01-22
101	1	Payroll System	120000.00	3	Saman Silva	Finance	60000	2019-01-22
105	5	Marketing Automation	60000.00	4	Amara Jayasinghe	IT	80000	2022-07-01
104	7	Help Desk System	70000.00	4	Amara Jayasinghe	IT	80000	2022-07-01
103	4	Inventory App	95000.00	4	Amara Jayasinghe	IT	80000	2022-07-01
102	2	Recruitment Protal	80000.00	4	Amara Jayasinghe	IT	80000	2022-07-01
101	1	Payroll System	120000.00	4	Amara Jayasinghe	IT	80000	2022-07-01
105	5	Marketing Automation	60000.00	5	Dilani Wickramasinghe	Marketing	45000	2023-02-14
104	7	Help Desk System	70000.00	5	Dilani Wickramasinghe	Marketing	45000	2023-02-14
103	4	Inventory App	95000.00	5	Dilani Wickramasinghe	Marketing	45000	2023-02-14
102	2	Recruitment Protal	80000.00	5	Dilani Wickramasinghe	Marketing	45000	2023-02-14
101	1	Payroll System	120000.00	5	Dilani Wickramasinghe	Marketing	45000	2023-02-14
105	5	Marketing Automation	60000.00	6	Ruwan Senanayake	HR	55000	2021-11-30
104	7	Help Desk System	70000.00	6	Ruwan Senanayake	HR	55000	2021-11-30
103	4	Inventory App	95000.00	6	Ruwan Senanayake	HR	55000	2021-11-30
102	2	Recruitment Protal	80000.00	6	Ruwan Senanayake	HR	55000	2021-11-30
101	1	Payroll System	120000.00	6	Ruwan Senanayake	HR	55000	2021-11-30
105	5	Marketing Automation	60000.00	7	Thilina Bandara	IT	70000	2020-08-05
104	7	Help Desk System	70000.00	7	Thilina Bandara	IT	70000	2020-08-05
103	4	Inventory App	95000.00	7	Thilina Bandara	IT	70000	2020-08-05
102	2	Recruitment Protal	80000.00	7	Thilina Bandara	IT	70000	2020-08-05
101	1	Payroll System	120000.00	7	Thilina Bandara	IT	70000	2020-08-05

```
35 rows in set (0.00 sec)
```