

SAWANT CONSTRUCTIONS



CONSTRUCTION COMPANY MANAGEMENT SYSTEM.





I.T. VEDANT
Decode your dreams

**CONSTRUCTION
COMPANY
MANAGEMENT
SYSTEM**



Final Project on SQL

NAME - NIVEDITA SAWANT

BATCH - T408

FACULTY INCHARGE - SANDIP JAISWAR

ABSTRACT:

Construction is the process of constructing a building or infrastructure. Construction differs from manufacturing. Manufacturing typically involves mass production of similar items without a designated purchaser, while construction typically takes place on location for a known client. Construction is directly tied to the fields of civil engineering and architecture. A construction company is responsible for building structures in the commercial and private sectors. In simple words, we can say that a construction company is a type of business, enterprise, or similar organization created and operating to construct a wide variety of buildings, developments, housing, path, pavement, roads, motorways, and other types of construction projects. A construction company involves lot of parameters like details of projects, employees, machineries and raw materials.



➤ **AIM OF PROJECT :**

The main goal of the construction project is to ensure that construction projects are successfully completed within the constraints of best quality, stated period and with minimum cost possible using MYSQL.

➤ **INTRODUCTION :**

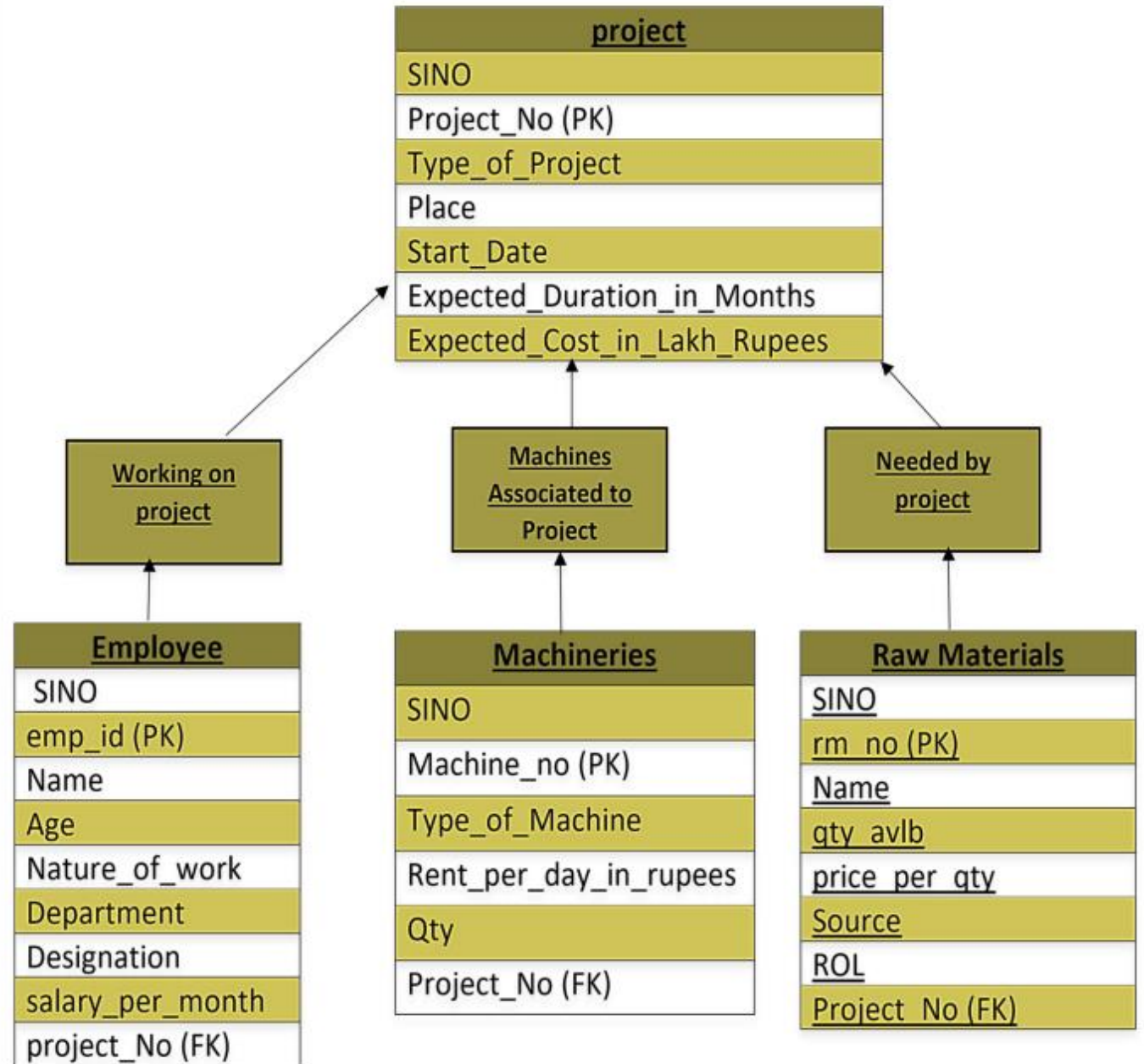
Construction management (CM) is a professional service that uses specialized, project management techniques and software to oversee the planning, design, and construction of a project, from its beginning to its end. The purpose of Construction management is to control a project's time / delivery, cost and quality—sometimes referred to as a project management triangle or "triple constraints". CM is compatible with all project delivery systems, including design-bid-build, design-build, CM At-Risk and Public Private Partnerships. Professional construction managers may be reserved for lengthy, large-scale, high budget undertakings (commercial real estate, transportation infrastructure, industrial facilities, and military infrastructure), called capital projects.



➤ OBJECTIVE OF PROJECT:

1. The company will be able to easily track the details of projects, employees, machineries and raw materials.
2. It will give a proper relation regarding which employees are working in which projects.
3. It will give details regarding how many raw materials are being allocated to each project.
4. It will help in tracking the machineries linked to each project.

ENTITY RELATIONSHIP DIAGRAM



A colorful illustration of a construction site. In the foreground, there's a yellow concrete mixer truck and a grey dump truck. Behind them are several buildings under construction, some with scaffolding and others with red roofs. A large yellow crane is visible in the background against a blue sky with white clouds. The ground is brown with some sand piles and wooden planks.

WE HAVE 4 TABLE'S IN THIS CONSTRUCTION COMPANY

- ❖ **PROJECTS**
- ❖ **EMPLOYEES**
- ❖ **MACHINERIES**
- ❖ **RAW MATERIALS**

STRUCTURE OF TABLE:

❖ PROJECTS

```
MariaDB [sawant]> CREATE TABLE PROJECTS(  
-> SLNO INT,  
-> PROJECT_NO INT PRIMARY KEY AUTO_INCREMENT,  
-> TYPE_OF_PROJECT VARCHAR(30),  
-> PLACE VARCHAR(30),  
-> START_DATE DATE,  
-> EXPECTED_DURATION_IN_MONTHS varchar(30),  
-> EXPECTEDCOST_IN_LAKH_RUPEES BIGINT);
```

Query OK, 0 rows affected (0.012 sec)

```
MariaDB [sawant]> desc projects;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
PROJECT_NO	int(11)	NO	PRI	NULL	auto_increment
TYPE_OF_PROJECT	varchar(30)	YES		NULL	
PLACE	varchar(30)	YES		NULL	
START_DATE	date	YES		NULL	
EXPECTED_DURATION_IN_MONTHS	varchar(30)	YES		NULL	
EXPECTEDCOST_IN_LAKH_RUPEES	bigint(20)	YES		NULL	

7 rows in set (0.010 sec)

EMPLOYEES

```
MariaDB [sawant]> CREATE TABLE EMPLOYEES(  
->     SLNO INT,  
->     EMPLOYEE_ID INT PRIMARY KEY AUTO_INCREMENT,  
->     NAME VARCHAR(30),  
->     AGE INT,  
->     NATURE_OF_WORK VARCHAR(30),  
->     DEPARTMENT varchar(30),  
->     DESIGNATION varchar(30),  
->     SALARY_PER_MONTH BIGINT,  
->     PROJECT_NO INT,  
->     FOREIGN KEY(PROJECT_NO)REFERENCES PROJECTS(PROJECT_NO)  
-> );
```

Query OK, 0 rows affected (0.017 sec)

```
MariaDB [sawant]> DESC EMPLOYEES;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
EMPLOYEE_ID	int(11)	NO	PRI	NULL	auto_increment
NAME	varchar(30)	YES		NULL	
AGE	int(11)	YES		NULL	
NATURE_OF_WORK	varchar(30)	YES		NULL	
DEPARTMENT	varchar(30)	YES		NULL	
DESIGNATION	varchar(30)	YES		NULL	
SALARY_PER_MONTH	bigint(20)	YES		NULL	
PROJECT_NO	int(11)	YES	MUL	NULL	

9 rows in set (0.007 sec)

❖ MACHINERIES

```
MariaDB [sawant]> CREATE TABLE MACHINERIES(  
->     SLNO INT,  
->     MACHINE_NO INT PRIMARY KEY AUTO_INCREMENT,  
->     TYPE_OF_MACHINE VARCHAR(30),  
->     RENT_PER_DAY_IN_RUPEES BIGINT,  
->     QUANTITY INT,  
->     PROJECT_NO INT  
-> );
```

Query OK, 0 rows affected (0.013 sec)

```
MariaDB [sawant]> DESC MACHINERIES;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
MACHINE_NO	int(11)	NO	PRI	NULL	auto_increment
TYPE_OF_MACHINE	varchar(30)	YES		NULL	
RENT_PER_DAY_IN_RUPEES	bigint(20)	YES		NULL	
QUANTITY	int(11)	YES		NULL	
PROJECT_NO	int(11)	YES		NULL	

6 rows in set (0.007 sec)

❖ RAW MATERIALS

```
MariaDB [sawant]> CREATE TABLE RAW_MATERIALS(  
->     SLNO INT,  
->     RAW_MATERIAL_NO INT PRIMARY KEY AUTO_INCREMENT,  
->     RM_NAME VARCHAR(30),  
->     QTY_AVAILABLE INT,  
->     PRICE_PER_QTY BIGINT,  
->     SOURCE varchar(30),  
->     PROJECT_NO INT,  
->     FOREIGN KEY(PROJECT_NO)REFERENCES PROJECTS(PROJECT_NO)  
-> );
```

Query OK, 0 rows affected (0.014 sec)

```
MariaDB [sawant]> DESC RAW_MATERIALS;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
RAW_MATERIAL_NO	int(11)	NO	PRI	NULL	auto_increment
RM_NAME	varchar(30)	YES		NULL	
QTY_AVAILABLE	int(11)	YES		NULL	
PRICE_PER_QTY	bigint(20)	YES		NULL	
SOURCE	varchar(30)	YES		NULL	
PROJECT_NO	int(11)	YES	MUL	NULL	

7 rows in set (0.007 sec)

INSERT VALUES INTO TABLE.

◆ PROJECTS

```
MariaDB [sawant]> INSERT INTO PROJECTS(SLNO,TYPE_OF_PROJECT,PLACE,START_DATE,EXPECTED_DURATION_IN_MONTHS,EXPECTEDCOST_IN_LAKH_RUPEES)
```

```
-> VALUES(1,'COMMERCIAL_BUILDING','BANGALORE','2022-04-01',48,5000),  
-> (2,'POLICE_STATION','TUMKUR','2023-01-01',28,200),  
-> (3,'SCHOOL','MANGALORE','2022-05-01',52,800),  
-> (4,'HOSTEL','MANGALORE','2022-05-05',48,100),  
-> (5,'CANTEEN','UDUPI','2023-05-01',18,60),  
-> (6,'BUS_DEPOT','COORG','2022-12-01',36,1500),  
-> (7,'COLLEGE','SHIVAMOGGA','2021-11-01',40,1200),  
-> (8,'COMPLEX','KARWAR','2023-04-01',38,2200),  
-> (9,'HOSPITAL','MYSORE','2022-01-01',50,2500),  
-> (10,'EMBASSY','BANBALORE','2021-05-01',29,3000),  
-> (11,'TEMPLE','HUBLI','2021-10-01',26,1000),  
-> (12,'AIRPORT','MYSORE','2020-12-01',54,3500);
```

❖ EMPLOYEES

```
MariaDB [sawant]> INSERT INTO EMPLOYEES(SLNO,NAME,AGE,NATURE_OF_WORK,DEPARTMENT,DESIGNATION,SALARY_PER_MONTH,PROJECT_NO)
-> VALUES(1,'ABHI',24,'ONSITE','CONSTRUCTION','CONSTRUCTION ENGINEER','30000',108),
-> (1,'BASU',23,'ONSITE','CONSTRUCTION','CONSTRUCTION ENGINEER','28000',104),
-> (2,'CECILIA',26,'ONSITE','FINANCIAL','FINANCIAL ENGINEER','32000',108),
-> (3,'RAGHU',32,'ONSITE','DEVELOPMENT','ENGINEER','33500',112),
-> (4,'CHURCHILL',21,'ONSITE','CONSTRUCTION','CONSTRUCTION ENGINEER','21700',101),
-> (5,'POORVI',24,'ONSITE','ARCHITECTURE','ARCHITECT','30500',107),
-> (6,'BHATTA',32,'OFFSITE','CONTRACTOR','GENERAL CONTRACTOR','29000',103),
-> (7,'SHIVU',45,'ONSITE','CONSTRUCTION','CONSTRUCTION MANAGER','54000',111),
-> (8,'MANOJ',37,'ONSITE','PROJECT','PROJECT ENGINEER','37000',110),
-> (9,'GOURAB',23,'ONSITE','CONSTRUCTION','CONSTRUCTION ENGINEER','24000',104),
-> (10,'ASHISH',29,'ONSITE','CIVIL','CIVIL ENGINEER','32000',103),
-> (11,'DEEPAK',27,'ONSITE','CONSTRUCTION','CONSTRUCTION ENGINEER','30000',105),
-> (12,'AMOGH',23,'OFFSITE','HUMAN RESOURCE','HR TRAINEE','24000',NULL),
-> (13,'MANISH',24,'OFFSITE','SURVEYOR','SURVE ENGINEER','22000',104),
-> (14,'CHAITANYA',21,'OFFSITE','HUMAN RESOURCE','HR TRAINEE','24000',NULL),
-> (15,'PRAVEEN',31,'OFFSITE','FIELD','FIELD ENGINEER','28000',101),
-> (16,'RAKSHITH',35,'ONSITE','CONSTRUCTION','CONSTRUCTION ENGINEER','34000',NULL),
-> (17,'SNEHA',29,'ONSITE','PURCHASING','ENGINEER','29000',NULL),
-> (18,'AMUL',40,'ONSITE','DESIGN','DESIGN ENGINEER','49000',102),
-> (19,'AKSHAY',33,'OFFSITE','ENGINEER DEPARTMENT','CIVIL ENGINEER','30000',109),
-> (20,'PRATIK',38,'ONSITE','DEVELOPMENT','ENGINEER','39000',NULL);
```


❖ MACHINERIES

```
MariaDB [sawant]> INSERT INTO MACHINERIES(SLNO,TYPE_OF_MACHINE,RENT_PER_DAY_IN_RUPEES,QUANTITY,PROJECT_NO)
-> VALUES(1,'CONCRETE MIXER 1 TON',5000,4,108),
-> (2,'EXCAVATOR',2000,6,105),
-> (3,'CONCRETE MIXER 2 TON',5000,2,104),
-> (4,'CONCRETE PUMP ',10000,1,102),
-> (5,'GRADERS',3000,5,108),
-> (6,'SCRAPER',3500,10,109),
-> (7,'CONCRETE MIXER 1 TON',1500,9,101),
-> (8,'TRENCHERS',2000,4,109),
-> (9,'MOTAR GRADERS',2500,5,101),
-> (10,'BULL DOZERS',400,2,111),
-> (11,'CONCRETE MIXER 1 TON',550,10,110),
-> (12,'COMMON DUMP TRUCKS',900,2,110),
-> (13,'MINI DUMPERS',700,4,111),
-> (14,'COMMON DUMP TRUCKS',1000,5,112),
-> (15,'SKID SKEE LOADRES',600,2,103),
-> (16,'BACK HOE LOADRES',500,4,NULL),
-> (17,'SELF LOADING CONCRETE MIXER',5000,1,102),
-> (18,'HYDRAULIC MOBILE STONE CRUSHER',15000,1,NULL),
-> (19,'CRAWLER LOADERS',2500,2,107),
-> (20,'CONCRETE MIXER 10 TON',5000,6,NULL);
Query OK, 20 rows affected (0.003 sec)
Records: 20  Duplicates: 0  Warnings: 0
```

❖ RAW MATERIALS

```
MariaDB [sawant]> INSERT INTO RAW_MATERIALS(SLNO, RM_NAME, QTY_AVAILABLE, PRICE_PER_QTY, SOURCE, PROJECT_NO)
-> VALUES(1, 'CEMENT BAG 10KG', 500, 350, 'JSW CEMENT', 108),
-> (2, 'BRICKS', 3000, 12, 'JK RAM', 111),
-> (3, 'SAND', 100, 3500, 'PRUTHVI CONSTRUCTION', 103),
-> (4, 'CONCRETE', 1500, 400, 'JK RAM', 107),
-> (5, 'AGGREGATE', 100, 2000, 'SACHI LTD', NULL),
-> (6, 'STEEL', 5000, 1990, 'JSW STEEL', 112),
-> (7, 'STEEL', 3000, 2100, 'TATA STEEL', 110),
-> (8, 'METAL', 1500, 150, 'HARI LTD', 104),
-> (9, 'FLYASH', 600, 450, 'SACHI LTD', 106),
-> (10, 'CEMENT BAG 10KG', 2500, 350, 'JSW CEMENT', 107),
-> (11, 'PLY WOOD', 100, 550, 'RAJAN WOOD', NULL),
-> (12, 'FINE SAND', 500, 4500, 'JK RAM', 101),
-> (13, 'TMT BAR', 4500, 2110, 'JSW STEEL', NULL),
-> (14, 'WHITE CEMENT', 300, 450, 'JSW CEMENT', 102),
-> (15, 'WHITE CRUSHER MIXTURE', 150, 2550, 'SHIV CRUSHERS', 105),
-> (16, 'CEMENT BAG 15KG', 300, 370, 'AMBUJA CEMENT', 108);
```


CONTENTS OF TABLES.

❖ PROJECTS

```
MariaDB [sawant]> SELECT * FROM PROJECTS;
```

SLNO	PROJECT_NO	TYPE_OF_PROJECT	PLACE	START_DATE	EXPECTED_DURATION_IN_MONTHS	EXPECTEDCOST_IN_LAKH_RUPEES
1	101	COMMERCIAL_BUILDING	BANGALORE	2022-04-01	48	5000
2	102	POLICE_STATION	TUMKUR	2023-01-01	28	200
3	103	SCHOOL	MANGALORE	2022-05-01	52	800
4	104	HOSTEL	MANGALORE	2022-05-05	48	100
5	105	CANTEEN	UDUPI	2023-05-01	18	60
6	106	BUS_DEPOT	COORG	2022-12-01	36	1500
7	107	COLLEGE	SHIVAMOGGA	2021-11-01	40	1200
8	108	COMPLEX	KARWAR	2023-04-01	38	2200
9	109	HOSPITAL	MYSORE	2022-01-01	50	2500
10	110	EMBASSY	BANBALORE	2021-05-01	29	3000
11	111	TEMPLE	HUBLI	2021-10-01	26	1000
12	112	AIRPORT	MYSORE	2020-12-01	54	3500

◆ EMPLOYEES

MariaDB [sawant]> SELECT * FROM EMPLOYEES;

SLNO	EMPLOYEE_ID	NAME	AGE	NATURE_OF_WORK	DEPARTMENT	DESIGNATION	SALARY_PER_MONTH	PROJECT_NO
1	5000	ABHI	24	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	108
1	5001	BASU	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	28000	104
2	5002	CECILIA	26	ONSITE	FINANCIAL	FINANCIAL ENGINEER	32000	108
3	5003	RAGHU	32	ONSITE	DEVELOPMENT	ENGINEER	33500	112
4	5004	CHURCHILL	21	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	21700	101
5	5005	POORVI	24	ONSITE	ARCHITECTURE	ARCHITECT	30500	107
6	5006	BHATTA	32	OFFSITE	CONTRACTOR	GENERAL CONTRACTOR	29000	103
7	5007	SHIVU	45	ONSITE	CONSTRUCTION	CONSTRUCTION MANAGER	54000	111
8	5008	MANOJ	37	ONSITE	PROJECT	PROJECT ENGINEER	37000	110
9	5009	GOURAB	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	24000	104
10	5010	ASHISH	29	ONSITE	CIVIL	CIVIL ENGINEER	32000	103
11	5011	DEEPAK	27	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	105
12	5012	AMOGH	23	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
13	5013	MANISH	24	OFFSITE	SURVEYOR	SURVE ENGINEER	22000	104
14	5014	CHAITANYA	21	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
15	5015	PRAVEEN	31	OFFSITE	FIELD	FIELD ENGINEER	28000	101
16	5016	RAKSHITH	35	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	34000	NULL
17	5017	SNEHA	29	ONSITE	PURCHASING	ENGINEER	29000	NULL
18	5018	AMUL	40	ONSITE	DESIGN	DESIGN ENGINEER	49000	102
19	5019	AKSHAY	33	OFFSITE	ENGINEER DEPARTMENT	CIVIL ENGINEER	30000	109
20	5020	PRATIK	38	ONSITE	DEVELOPMENT	ENGINEER	39000	NULL

21 rows in set (0.000 sec)

❖ MACHINERIES

```
MariaDB [sawant]> SELECT * FROM MACHINERIES;
```

SLNO	MACHINE_NO	TYPE_OF_MACHINE	RENT_PER_DAY_IN_RUPEES	QUANTITY	PROJECT_NO
1	111	CONCRETE MIXER 1 TON	5000	4	108
2	112	EXCAVATOR	2000	6	105
3	113	CONCRETE MIXER 2 TON	5000	2	104
4	114	CONCRETE PUMP	10000	1	102
5	115	GRADERS	3000	5	108
6	116	SCRAPER	3500	10	109
7	117	CONCRETE MIXER 1 TON	1500	9	101
8	118	TRENCHERS	2000	4	109
9	119	MOTAR GRADERS	2500	5	101
10	120	BULL DOZERS	400	2	111
11	121	CONCRETE MIXER 1 TON	550	10	110
12	122	COMMON DUMP TRUCKS	900	2	110
13	123	MINI DUMPERS	700	4	111
14	124	COMMON DUMP TRUCKS	1000	5	112
15	125	SKID SKEE LOADRES	600	2	103
16	126	BACK HOE LOADRES	500	4	NULL
17	127	SELF LOADING CONCRETE MIXER	5000	1	102
18	128	HYDRAULIC MOBILE STONE CRUSHER	15000	1	NULL
19	129	CRAWLER LOADERS	2500	2	107
20	130	CONCRETE MIXER 10 TON	5000	6	NULL

```
20 rows in set (0.000 sec)
```

❖ RAW MATERIALS

```
MariaDB [sawant]> SELECT * FROM RAW_MATERIALS;
```

SLNO	RAW_MATERIAL_NO	RM_NAME	QTY_AVAILABLE	PRICE_PER_QTY	SOURCE	PROJECT_NO
1	101	CEMENT BAG 10KG	500	350	JSW CEMENT	108
2	102	BRICKS	3000	12	JK RAM	111
3	103	SAND	100	3500	PRUTHVI CONSTRUCTION	103
4	104	CONCRETE	1500	400	JK RAM	107
5	105	AGGREGATE	100	2000	SACHI LTD	NULL
6	106	STEEL	5000	1990	JSW STEEL	112
7	107	STEEL	3000	2100	TATA STEEL	110
8	108	METAL	1500	150	HARI LTD	104
9	109	FLYASH	600	450	SACHI LTD	106
10	110	CEMENT BAG 10KG	2500	350	JSW CEMENT	107
11	111	PLY WOOD	100	550	RAJAN WOOD	NULL
12	112	FINE SAND	500	4500	JK RAM	101
13	113	TMT BAR	4500	2110	JSW STEEL	NULL
14	114	WHITE CEMENT	300	450	JSW CEMENT	102
15	115	WHITE CRUSHER MIXTURE	150	2550	SHIV CRUSHERS	105
16	116	CEMENT BAG 15KG	300	370	AMBUJA CEMENT	108

```
16 rows in set (0.000 sec)
```


❖ ADD COLUMN

ALTER TABLE PROJECTS

ADD COLUMN EXPECTED_END_DATE VARCHAR(30) AFTER START_DATE;

```
MariaDB [sawant]> ALTER TABLE PROJECTS
-> ADD COLUMN EXPECTED_END_DATE VARCHAR(30) AFTER START_DATE;
Query OK, 0 rows affected (0.026 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
MariaDB [sawant]> DESC PROJECTS;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
PROJECT_NO	int(11)	NO	PRI	NULL	auto_increment
TYPE_OF_PROJECT	varchar(30)	YES		NULL	
PLACE	varchar(30)	YES		NULL	
START_DATE	date	YES		NULL	
EXPECTED_END_DATE	varchar(30)	YES		NULL	
EXPECTED_DURATION_IN_MONTHS	varchar(30)	YES		NULL	
EXPECTEDCOST_IN_LAKH_RUPEES	bigint(20)	YES		NULL	

❖ DROP COLUMN

ALTER TABLE PROJECTS

DROP COLUMN EXPECTED_END_DATE;

```
MariaDB [sawant]> ALTER TABLE PROJECTS
-> DROP COLUMN EXPECTED_END_DATE;
Query OK, 0 rows affected (0.021 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
MariaDB [sawant]> DESC PROJECTS;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
PROJECT_NO	int(11)	NO	PRI	NULL	auto_increment
TYPE_OF_PROJECT	varchar(30)	YES		NULL	
PLACE	varchar(30)	YES		NULL	
START_DATE	date	YES		NULL	
EXPECTED_DURATION_IN_MONTHS	varchar(30)	YES		NULL	
EXPECTEDCOST_IN_LAKH_RUPEES	bigint(20)	YES		NULL	

7 rows in set (0.013 sec)

UPDATE COLUMN

UPDATE EMPLOYEES

SET DESIGNATION='DEVELOPMENT ENGINEER' WHERE NAME='RAGHU';

```
MariaDB [sawant]> UPDATE EMPLOYEES
-> SET DESIGNATION='DEVELOPMENT ENGINEER' WHERE NAME='RAGHU';
Query OK, 1 row affected (0.010 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
MariaDB [sawant]> SELECT *FROM EMPLOYEES;
```

SLNO	EMPLOYEE_ID	NAME	AGE	NATURE_OF_WORK	DEPARTMENT	DESIGNATION	SALARY_PER_MONTH	PROJECT_NO
1	5000	ABHI	24	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	108
1	5001	BASU	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	28000	104
2	5002	CECILIA	26	ONSITE	FINANCIAL	FINANCIAL ENGINEER	32000	108
3	5003	RAGHU	32	ONSITE	DEVELOPMENT	DEVELOPMENT ENGINEER	33500	112
4	5004	CHURCHILL	21	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	21700	101
5	5005	POORVI	24	ONSITE	ARCHITECTURE	ARCHITECT	30500	107
6	5006	BHATTA	32	OFFSITE	CONTRACTOR	GENERAL CONTRACTOR	29000	103
7	5007	SHIVU	45	ONSITE	CONSTRUCTION	CONSTRUCTION MANAGER	54000	111
8	5008	MANOJ	37	ONSITE	PROJECT	PROJECT ENGINEER	37000	110
9	5009	GOURAB	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	24000	104
10	5010	ASHISH	29	ONSITE	CIVIL	CIVIL ENGINEER	32000	103
11	5011	DEEPAK	27	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	105
12	5012	AMOGH	23	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
13	5013	MANISH	24	OFFSITE	SURVEYOR	SURVE ENGINEER	22000	104
14	5014	CHAITANYA	21	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
15	5015	PRAVEEN	31	OFFSITE	FIELD	FIELD ENGINEER	28000	101
16	5016	RAKSHITH	35	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	34000	NULL
17	5017	SNEHA	29	ONSITE	PURCHASING	ENGINEER	29000	NULL
18	5018	AMUL	40	ONSITE	DESIGN	DESIGN ENGINEER	49000	102
19	5019	AKSHAY	33	OFFSITE	ENGINEER DEPARTMENT	CIVIL ENGINEER	30000	109
20	5020	PRATIK	38	ONSITE	DEVELOPMENT	ENGINEER	39000	NULL

```
21 rows in set (0.002 sec)
```


CHANGE COLUMN NAME AND DATATYPE

ALTER TABLE EMPLOYEES

CHANGE COLUMN NAME EMPLOYEE_NAME VARCHAR(30);

```
MariaDB [sawant]> ALTER TABLE EMPLOYEES
-> CHANGE COLUMN NAME EMPLOYEE_NAME VARCHAR(30);
Query OK, 0 rows affected (0.016 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
MariaDB [sawant]>
MariaDB [sawant]>
MariaDB [sawant]> DESC EMPLOYEES;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
EMPLOYEE_ID	int(11)	NO	PRI	NULL	auto_increment
EMPLOYEE_NAME	varchar(30)	YES		NULL	
AGE	int(11)	YES		NULL	
NATURE_OF_WORK	varchar(30)	YES		NULL	
DEPARTMENT	varchar(30)	YES		NULL	
DESIGNATION	varchar(30)	YES		NULL	
SALARY_PER_MONTH	bigint(20)	YES		NULL	
PROJECT_NO	int(11)	YES	MUL	NULL	

MODIFY DATATYPE,CONSTRAINT OF EXISTING COLUMN.

ALTER TABLE EMPLOYEES

MODIFY COLUMN AGE VARCHAR(20) NOT NULL;

```
MariaDB [sawant]> ALTER TABLE EMPLOYEES
-> MODIFY COLUMN AGE VARCHAR(20) NOT NULL;
Query OK, 21 rows affected (0.091 sec)
Records: 21 Duplicates: 0 Warnings: 0
```

```
MariaDB [sawant]> DESC EMPLOYEES;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
EMPLOYEE_ID	int(11)	NO	PRI	NULL	auto_increment
EMPLOYEE_NAME	varchar(30)	YES		NULL	
AGE	varchar(20)	NO		NULL	
NATURE_OF_WORK	varchar(30)	YES		NULL	
DEPARTMENT	varchar(30)	YES		NULL	
DESIGNATION	varchar(30)	YES		NULL	
SALARY_PER_MONTH	bigint(20)	YES		NULL	
PROJECT_NO	int(11)	YES	MUL	NULL	

NIVEDITA SAWANT

RENAME TABLE

ALTER TABLE EMPLOYEES

RENAME EMPLOYEE_INFORMATION;

```
MariaDB [sawant]> ALTER TABLE EMPLOYEES  
-> RENAME EMPLOYEE_INFORMATION;  
Query OK, 0 rows affected (0.012 sec)
```

```
MariaDB [sawant]>  
MariaDB [sawant]> DESC EMPLOYEE_INFORMATION;
```

Field	Type	Null	Key	Default	Extra
SLNO	int(11)	YES		NULL	
EMPLOYEE_ID	int(11)	NO	PRI	NULL	auto_increment
EMPLOYEE_NAME	varchar(30)	YES		NULL	
AGE	varchar(20)	NO		NULL	
NATURE_OF_WORK	varchar(30)	YES		NULL	
DEPARTMENT	varchar(30)	YES		NULL	
DESIGNATION	varchar(30)	YES		NULL	
SALARY_PER_MONTH	bigint(20)	YES		NULL	
PROJECT_NO	int(11)	YES	MUL	NULL	

WHERE CONDITION

SELECT * FROM MACHINERIES WHERE RENT_PER_DAY_IN_RUPEES >=1000;

MariaDB [sawant]> SELECT * FROM MACHINERIES WHERE RENT_PER_DAY_IN_RUPEES >=1000;

SLNO	MACHINE_NO	TYPE_OF_MACHINE	RENT_PER_DAY_IN_RUPEES	QUANTITY	PROJECT_NO
1	111	CONCRETE MIXER 1 TON	5000	4	108
2	112	EXCAVATOR	2000	6	105
3	113	CONCRETE MIXER 2 TON	5000	2	104
4	114	CONCRETE PUMP	10000	1	102
5	115	GRADERS	3000	5	108
6	116	SCRAPER	3500	10	109
7	117	CONCRETE MIXER 1 TON	1500	9	101
8	118	TRENCHERS	2000	4	109
9	119	MOTAR GRADERS	2500	5	101
14	124	COMMON DUMP TRUCKS	1000	5	112
17	127	SELF LOADING CONCRETE MIXER	5000	1	102
18	128	HYDRAULIC MOBILE STONE CRUSHER	15000	1	NULL
19	129	CRAWLER LOADERS	2500	2	107
20	130	CONCRETE MIXER 10 TON	5000	6	NULL

14 rows in set (0.002 sec)

SELECT TYPE_OF_MACHINE FROM MACHINERIES WHERE RENT_PER_DAY_IN_RUPEES >=1000;

```
MariaDB [sawant]> SELECT TYPE_OF_MACHINE FROM MACHINERIES WHERE RENT_PER_DAY_IN_RUPEES >=1000;
```

TYPE_OF_MACHINE
CONCRETE MIXER 1 TON
EXCAVATOR
CONCRETE MIXER 2 TON
CONCRETE PUMP
GRADERS
SCRAPER
CONCRETE MIXER 1 TON
TRENCHERS
MOTAR GRADERS
COMMON DUMP TRUCKS
SELF LOADING CONCRETE MIXER
HYDRAULIC MOBILE STONE CRUSHER
CRAWLER LOADERS
CONCRETE MIXER 10 TON

14 rows in set (0.000 sec)

IS NULL & IS NOT NULL

SELECT * FROM EMPLOYEE_INFORMATION

WHERE PROJECT_NO IS NULL;

```
MariaDB [sawant]> SELECT * FROM EMPLOYEE_INFORMATION  
-> WHERE PROJECT_NO IS NULL;
```

SLNO	EMPLOYEE_ID	EMPLOYEE_NAME	AGE	NATURE_OF_WORK	DEPARTMENT	DESIGNATION	SALARY_PER_MONTH	PROJECT_NO
12	5012	AMOGH	23	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
14	5014	CHAITANYA	21	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
16	5016	RAKSHITH	35	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	34000	NULL
17	5017	SNEHA	29	ONSITE	PURCHASING	ENGINEER	29000	NULL
20	5020	PRATIK	38	ONSITE	DEVELOPMENT	ENGINEER	39000	NULL

5 rows in set (0.007 sec)

SELECT * FROM EMPLOYEE_INFORMATION

WHERE PROJECT_NO IS NOT NULL;

```
MariaDB [sawant]> SELECT * FROM EMPLOYEE_INFORMATION  
-> WHERE PROJECT_NO IS NOT NULL;
```

SLNO	EMPLOYEE_ID	EMPLOYEE_NAME	AGE	NATURE_OF_WORK	DEPARTMENT	DESIGNATION	SALARY_PER_MONTH	PROJECT_NO
1	5000	ABHI	24	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	108
1	5001	BASU	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	28000	104
2	5002	CECILIA	26	ONSITE	FINANCIAL	FINANCIAL ENGINEER	32000	108
3	5003	RAGHU	32	ONSITE	DEVELOPMENT	DEVELOPMENT ENGINEER	33500	112
4	5004	CHURCHILL	21	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	21700	101
5	5005	POORVI	24	ONSITE	ARCHITECTURE	ARCHITECT	30500	107
6	5006	BHATTA	32	OFFSITE	CONTRACTOR	GENERAL CONTRACTOR	29000	103
7	5007	SHIVU	45	ONSITE	CONSTRUCTION	CONSTRUCTION MANAGER	54000	111
8	5008	MANOJ	37	ONSITE	PROJECT	PROJECT ENGINEER	37000	110
9	5009	GOURAB	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	24000	104
10	5010	ASHISH	29	ONSITE	CIVIL	CIVIL ENGINEER	32000	103
11	5011	DEEPAK	27	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	105
13	5013	MANISH	24	OFFSITE	SURVEYOR	SURVE ENGINEER	22000	104
15	5015	PRAVEEN	31	OFFSITE	FIELD	FIELD ENGINEER	28000	101
18	5018	AMUL	40	ONSITE	DESIGN	DESIGN ENGINEER	49000	102
19	5019	AKSHAY NIVEDITA SAWANT	33	OFFSITE	ENGINEER DEPARTMENT	CIVIL ENGINEER	30000	109

BETWEEN OPERATOR

SELECT EMPLOYEE_NAME,DEPARTMENT,SALARY_PER_MONTH FROM EMPLOYEE_INFORMATION WHERE SALARY_PER_MONTH BETWEEN 20000 AND 35000;

```
MariaDB [sawant]> SELECT EMPLOYEE_NAME ,DEPARTMENT,SALARY_PER_MONTH FROM EMPLOYEE_INFORMATION WHERE SALARY_PER_MONTH BETWEEN 20000 AND 35000;
```

EMPLOYEE_NAME	DEPARTMENT	SALARY_PER_MONTH
ABHI	CONSTRUCTION	30000
BASU	CONSTRUCTION	28000
CECILIA	FINANCIAL	32000
RAGHU	DEVELOPMENT	33500
CHURCHILL	CONSTRUCTION	21700
POORVI	ARCHITECTURE	30500
BHATTA	CONTRACTOR	29000
GOURAB	CONSTRUCTION	24000
ASHISH	CIVIL	32000
DEEPAK	CONSTRUCTION	30000
AMOGH	HUMAN RESOURCE	24000
MANISH	SURVEYOR	22000
CHAITANYA	HUMAN RESOURCE	24000
PRAVEEN	FIELD	28000
RAKSHITH	CONSTRUCTION	34000
SNEHA	PURCHASING	29000
AKSHAY	ENGINEER DEPARTMENT	30000

SELECT EMPLOYEE_NAME,DEPARTMENT,SALARY_PER_MONTH FROM EMPLOYEE_INFORMATION WHERE EMPLOYEE_NAME BETWEEN 'A' AND 'S';

```
MariaDB [sawant]> SELECT EMPLOYEE_NAME ,DEPARTMENT,SALARY_PER_MONTH FROM EMPLOYEE_INFORMATION WHERE EMPLOYEE_NAME BETWEEN 'A' AND 'S';
```

EMPLOYEE_NAME	DEPARTMENT	SALARY_PER_MONTH
ABHI	CONSTRUCTION	30000
BASU	CONSTRUCTION	28000
CECILIA	FINANCIAL	32000
RAGHU	DEVELOPMENT	33500
CHURCHILL	CONSTRUCTION	21700
POORVI	ARCHITECTURE	30500
BHATTA	CONTRACTOR	29000
MANOJ	PROJECT	37000
GOURAB	CONSTRUCTION	24000
ASHISH	CIVIL	32000
DEEPAK	CONSTRUCTION	30000
AMOGH	HUMAN RESOURCE	24000
MANISH	SURVEYOR	22000
CHAITANYA	HUMAN RESOURCE	24000
PRAVEEN	FIELD	28000
RAKSHITH	CONSTRUCTION	34000
AMUL	DESIGN	49000
AKSHAY	ENGINEER DEPARTMENT	30000
PRATIK	DEVELOPMENT	39000

LIMIT FUNCTION

SELECT * FROM MACHINERIES
LIMIT 10;

```
MariaDB [sawant]> SELECT * FROM MACHINERIES  
-> LIMIT 10;
```

SLNO	MACHINE_NO	TYPE_OF_MACHINE	RENT_PER_DAY_IN_RUPEES	QUANTITY	PROJECT_NO
1	111	CONCRETE MIXER 1 TON	5000	4	108
2	112	EXCAVATOR	2000	6	105
3	113	CONCRETE MIXER 2 TON	5000	2	104
4	114	CONCRETE PUMP	10000	1	102
5	115	GRADERS	3000	5	108
6	116	SCRAPER	3500	10	109
7	117	CONCRETE MIXER 1 TON	1500	9	101
8	118	TRENCHERS	2000	4	109
9	119	MOTAR GRADERS	2500	5	101
10	120	BULL DOZERS	400	2	111

10 rows in set (0.000 sec)

SELECT * FROM MACHINERIES
LIMIT 2,8;

```
MariaDB [sawant]> SELECT * FROM MACHINERIES  
-> LIMIT 2,8;
```

SLNO	MACHINE_NO	TYPE_OF_MACHINE	RENT_PER_DAY_IN_RUPEES	QUANTITY	PROJECT_NO
3	113	CONCRETE MIXER 2 TON	5000	2	104
4	114	CONCRETE PUMP	10000	1	102
5	115	GRADERS	3000	5	108
6	116	SCRAPER	3500	10	109
7	117	CONCRETE MIXER 1 TON	1500	9	101
8	118	TRENCHERS	2000	4	109
9	119	MOTAR GRADERS	2500	5	101
10	120	BULL DOZERS	400	2	111

NIVEDITA SAWANT

LIKE OPERATOR

SELECT * FROM EMPLOYEE_INFORMATION WHERE DESIGNATION LIKE '%ENGINEER';

```
MariaDB [sawant]> SELECT * FROM EMPLOYEE_INFORMATION WHERE DESIGNATION LIKE '%ENGINEER';
```

SLNO	EMPLOYEE_ID	EMPLOYEE_NAME	AGE	NATURE_OF_WORK	DEPARTMENT	DESIGNATION	SALARY_PER_MONTH	PROJECT_NO
1	5000	ABHI	24	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	108
1	5001	BASU	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	28000	104
2	5002	CECILIA	26	ONSITE	FINANCIAL	FINANCIAL ENGINEER	32000	108
3	5003	RAGHU	32	ONSITE	DEVELOPMENT	DEVELOPMENT ENGINEER	33500	112
4	5004	CHURCHILL	21	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	21700	101
8	5008	MANOJ	37	ONSITE	PROJECT	PROJECT ENGINEER	37000	110
9	5009	GOURAB	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	24000	104
10	5010	ASHISH	29	ONSITE	CIVIL	CIVIL ENGINEER	32000	103
11	5011	DEEPAK	27	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	105
13	5013	MANISH	24	OFFSITE	SURVEYOR	SURVE ENGINEER	22000	104
15	5015	PRAVEEN	31	OFFSITE	FIELD	FIELD ENGINEER	28000	101
16	5016	RAKSHITH	35	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	34000	NULL
17	5017	SNEHA	29	ONSITE	PURCHASING	ENGINEER	29000	NULL
18	5018	AMUL	40	ONSITE	DESIGN	DESIGN ENGINEER	49000	102
19	5019	AKSHAY	33	OFFSITE	ENGINEER DEPARTMENT	CIVIL ENGINEER	30000	109
20	5020	PRATIK	38	ONSITE	DEVELOPMENT	ENGINEER	39000	NULL

SELECT * FROM EMPLOYEE_INFORMATION WHERE NATURE_OF_WORK LIKE 'ON%';

```
MariaDB [sawant]> SELECT * FROM EMPLOYEE_INFORMATION WHERE NATURE_OF_WORK LIKE 'ON%';
```

SLNO	EMPLOYEE_ID	EMPLOYEE_NAME	AGE	NATURE_OF_WORK	DEPARTMENT	DESIGNATION	SALARY_PER_MONTH	PROJECT_NO
1	5000	ABHI	24	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	108
1	5001	BASU	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	28000	104
2	5002	CECILIA	26	ONSITE	FINANCIAL	FINANCIAL ENGINEER	32000	108
3	5003	RAGHU	32	ONSITE	DEVELOPMENT	DEVELOPMENT ENGINEER	33500	112
4	5004	CHURCHILL	21	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	21700	101
5	5005	POORVI	24	ONSITE	ARCHITECTURE	ARCHITECT	30500	107
7	5007	SHIVU	45	ONSITE	CONSTRUCTION	CONSTRUCTION MANAGER	54000	111
8	5008	MANOJ	37	ONSITE	PROJECT	PROJECT ENGINEER	37000	110
9	5009	GOURAB	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	24000	104
10	5010	ASHISH	29	ONSITE	CIVIL	CIVIL ENGINEER	32000	103
11	5011	DEEPAK	27	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	105
16	5016	RAKSHITH	35	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	34000	NULL
17	5017	SNEHA	29	ONSITE	PURCHASING	ENGINEER	29000	NULL
18	5018	AMUL	40	ONSITE	DESIGN	DESIGN ENGINEER	49000	102
20	5020	PRATIK	38	ONSITE	DEVELOPMENT	ENGINEER	39000	NULL

SELECT * FROM EMPLOYEE_INFORMATION WHERE DESIGNATION NOT LIKE '%ENGINEER%';

MariaDB [sawant]> SELECT * FROM EMPLOYEE_INFORMATION WHERE DESIGNATION NOT LIKE '%ENGINEER%';

SLNO	EMPLOYEE_ID	EMPLOYEE_NAME	AGE	NATURE_OF_WORK	DEPARTMENT	DESIGNATION	SALARY_PER_MONTH	PROJECT_NO
1	5000	ABHI	24	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	108
1	5001	BASU	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	28000	104
2	5002	CECILIA	26	ONSITE	FINANCIAL	FINANCIAL ENGINEER	32000	108
3	5003	RAGHU	32	ONSITE	DEVELOPMENT	DEVELOPMENT ENGINEER	33500	112
4	5004	CHURCHILL	21	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	21700	101
5	5005	POORVI	24	ONSITE	ARCHITECTURE	ARCHITECT	30500	107
6	5006	BHATTA	32	OFFSITE	CONTRACTOR	GENERAL CONTRACTOR	29000	103
7	5007	SHIVU	45	ONSITE	CONSTRUCTION	CONSTRUCTION MANAGER	54000	111
8	5008	MANOJ	37	ONSITE	PROJECT	PROJECT ENGINEER	37000	110
9	5009	GOURAB	23	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	24000	104
10	5010	ASHISH	29	ONSITE	CIVIL	CIVIL ENGINEER	32000	103
11	5011	DEEPAK	27	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	30000	105
12	5012	AMOGH	23	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
13	5013	MANISH	24	OFFSITE	SURVEYOR	SURVE ENGINEER	22000	104
14	5014	CHAITANYA	21	OFFSITE	HUMAN RESOURCE	HR TRAINEE	24000	NULL
15	5015	PRAVEEN	31	OFFSITE	FIELD	FIELD ENGINEER	28000	101
16	5016	RAKSHITH	35	ONSITE	CONSTRUCTION	CONSTRUCTION ENGINEER	34000	NULL
17	5017	SNEHA	29	ONSITE	PURCHASING	ENGINEER	29000	NULL
18	5018	AMUL	40	ONSITE	DESIGN	DESIGN ENGINEER	49000	102
19	5019	AKSHAY	33	OFFSITE	ENGINEER DEPARTMENT	CIVIL ENGINEER	30000	109
20	5020	PRATIK	38	ONSITE	DEVELOPMENT	ENGINEER	39000	NULL

21 rows in set (0.000 sec)

ORDER BY CLAUSE

SELECT * FROM PROJECTS ORDER BY EXPECTEDCOST_IN_LAKH_RUPEES DESC;

```
MariaDB [sawant]> SELECT * FROM PROJECTS ORDER BY EXPECTEDCOST_IN_LAKH_RUPEES DESC;
```

SLNO	PROJECT_NO	TYPE_OF_PROJECT	PLACE	START_DATE	EXPECTED_DURATION_IN_MONTHS	EXPECTEDCOST_IN_LAKH_RUPEES
1	101	COMMERCIAL_BUILDING	BANGALORE	2022-04-01	48	5000
12	112	AIRPORT	MYSORE	2020-12-01	54	3500
10	110	EMBASSY	BANBALORE	2021-05-01	29	3000
9	109	HOSPITAL	MYSORE	2022-01-01	50	2500
8	108	COMPLEX	KARWAR	2023-04-01	38	2200
6	106	BUS_DEPOT	COORG	2022-12-01	36	1500
7	107	COLLEGE	SHIVAMOGGA	2021-11-01	40	1200
11	111	TEMPLE	HUBLI	2021-10-01	26	1000
3	103	SCHOOL	MANGALORE	2022-05-01	52	800
2	102	POLICE_STATION	TUMKUR	2023-01-01	28	200
4	104	HOSTEL	MANGALORE	2022-05-05	48	100
5	105	CANTEEN	UDUPI	2023-05-01	18	60

SELECT * FROM PROJECTS ORDER BY EXPECTEDCOST_IN_LAKH_RUPEES ASC;

```
MariaDB [sawant]> SELECT * FROM PROJECTS ORDER BY EXPECTEDCOST_IN_LAKH_RUPEES ASC;
```

SLNO	PROJECT_NO	TYPE_OF_PROJECT	PLACE	START_DATE	EXPECTED_DURATION_IN_MONTHS	EXPECTEDCOST_IN_LAKH_RUPEES
5	105	CANTEEN	UDUPI	2023-05-01	18	60
4	104	HOSTEL	MANGALORE	2022-05-05	48	100
2	102	POLICE_STATION	TUMKUR	2023-01-01	28	200
3	103	SCHOOL	MANGALORE	2022-05-01	52	800
11	111	TEMPLE	HUBLI	2021-10-01	26	1000
7	107	COLLEGE	SHIVAMOGGA	2021-11-01	40	1200
6	106	BUS_DEPOT	COORG	2022-12-01	36	1500
8	108	COMPLEX	KARWAR	2023-04-01	38	2200
9	109	HOSPITAL	MYSORE	2022-01-01	50	2500
10	110	EMBASSY	BANBALORE	2021-05-01	29	3000
12	112	AIRPORT	MYSORE	2020-12-01	54	3500
1	101	COMMERCIAL_BUILDING	BANGALORE	2022-04-01	48	5000

DISTINCT SYNTAX

SELECT DISTINCT PLACE FROM PROJECTS;

```
MariaDB [sawant]> SELECT DISTINCT PLACE FROM PROJECTS;
```

PLACE
BANGALORE
TUMKUR
MANGALORE
UDUPI
COORG
SHIVAMOGGA
KARWAR
MYSORE
BANBALORE
HUBLI

```
10 rows in set (0.002 sec)
```

GROUP BY

SELECT EMPLOYEE_NAME,COUNT(*) FROM EMPLOYEE_INFORMATION;

```
MariaDB [sawant]> SELECT EMPLOYEE_NAME,COUNT(*) FROM EMPLOYEE_INFORMATION;
+-----+-----+
| EMPLOYEE_NAME | COUNT(*) |
+-----+-----+
| ABHI          | 21      |
+-----+-----+
```

SELECT EMPLOYEE_NAME,DEPARTMENT,COUNT(*) FROM EMPLOYEE_INFORMATION GROUP BY DEPARTMENT;

```
MariaDB [sawant]> SELECT EMPLOYEE_NAME,DEPARTMENT,COUNT(*) FROM EMPLOYEE_INFORMATION GROUP BY DEPARTMENT;
+-----+-----+-----+
| EMPLOYEE_NAME | DEPARTMENT          | COUNT(*) |
+-----+-----+-----+
| POORVI        | ARCHITECTURE         | 1        |
| ASHISH        | CIVIL                | 1        |
| ABHI          | CONSTRUCTION         | 7        |
| BHATTA        | CONTRACTOR           | 1        |
| AMUL          | DESIGN               | 1        |
| RAGHU         | DEVELOPMENT           | 2        |
| AKSHAY        | ENGINEER DEPARTMENT  | 1        |
| PRAVEEN       | FIELD                | 1        |
| CECILIA       | FINANCIAL             | 1        |
| AMOGH         | HUMAN RESOURCE       | 2        |
| MANOJ         | PROJECT              | 1        |
| SNEHA         | PURCHASING           | 1        |
| MANISH        | SURVEYOR             | 1        |
+-----+-----+-----+
```

JOINS

Joins are used to combine rows from two or more tables based on a related column between them.

❖ INNER JOIN

- EQUI JOIN
- NON EQUI JOIN
- NATURAL JOIN

❖ OUTER JOIN

- LEFT JOIN
- RIGHT JOIN
- FULL JOIN

❖ INNER JOIN

```
SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME, EMPLOYEE_INFORMATION.DESIGNATION,  
PROJECTS.TYPE_OF_PROJECT  
FROM EMPLOYEE_INFORMATION  
INNER JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO = PROJECTS.PROJECT_NO;
```

❖ OUTER JOIN

1.LEFT JOIN

```
SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME,PROJECTS.TYPE_OF_PROJECT  
FROM EMPLOYEE_INFORMATION  
LEFT JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO = PROJECTS.PROJECT_NO;
```

2.RIGHT JOIN

```
SELECT EMPLOYEES.NAME, EMPLOYEES.DESIGNATION, PROJECTS.TYPE_OF_PROJECT  
FROM EMPLOYEES  
RIGHT JOIN PROJECTS ON EMPLOYEES.PROJECT_NO = PROJECTS.PROJECT_NO;
```

❖ EQUI JOIN

```
MariaDB [sawant]> SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME, EMPLOYEE_INFORMATION.DESIGNATION, PROJECTS.TYPE_OF_PROJECT  
-> FROM EMPLOYEE_INFORMATION  
-> INNER JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO = PROJECTS.PROJECT_NO;
```

EMPLOYEE_NAME	DESIGNATION	TYPE_OF_PROJECT
CHURCHILL	CONSTRUCTION ENGINEER	COMMERCIAL_BUILDING
PRAVEEN	FIELD ENGINEER	COMMERCIAL_BUILDING
AMUL	DESIGN ENGINEER	POLICE_STATION
BHATTA	GENERAL CONTRACTOR	SCHOOL
ASHISH	CIVIL ENGINEER	SCHOOL
BASU	CONSTRUCTION ENGINEER	HOSTEL
GOURAB	CONSTRUCTION ENGINEER	HOSTEL
MANISH	SURVE ENGINEER	HOSTEL
DEEPAK	CONSTRUCTION ENGINEER	CANTEEN
POORVI	ARCHITECT	COLLEGE
ABHI	CONSTRUCTION ENGINEER	COMPLEX
CECILIA	FINANCIAL ENGINEER	COMPLEX
AKSHAY	CIVIL ENGINEER	HOSPITAL
MANOJ	PROJECT ENGINEER	EMBASSY
SHIVU	CONSTRUCTION MANAGER	TEMPLE
RAGHU	DEVELOPMENT ENGINEER	AIRPORT

```
16 rows in set (0.004 sec)
```

- **NON EQUI JOIN**

**SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME, EMPLOYEE_INFORMATION.DESIGNATION,
PROJECTS.TYPE_OF_PROJECT
FROM EMPLOYEE_INFORMATION
INNER JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO != PROJECTS.PROJECT_NO;**

```
MariaDB [sawant]> SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME, EMPLOYEE_INFORMATION.DESIGNATION, PROJECTS.TYPE_OF_PROJECT  
-> FROM EMPLOYEE_INFORMATION  
-> INNER JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO != PROJECTS.PROJECT_NO;
```

EMPLOYEE_NAME	DESIGNATION	TYPE_OF_PROJECT
ABHI	CONSTRUCTION ENGINEER	COMMERCIAL_BUILDING
ABHI	CONSTRUCTION ENGINEER	POLICE_STATION
ABHI	CONSTRUCTION ENGINEER	SCHOOL
ABHI	CONSTRUCTION ENGINEER	HOSTEL
ABHI	CONSTRUCTION ENGINEER	CANTEEN
ABHI	CONSTRUCTION ENGINEER	BUS_DEPOT
ABHI	CONSTRUCTION ENGINEER	COLLEGE
ABHI	CONSTRUCTION ENGINEER	HOSPITAL
ABHI	CONSTRUCTION ENGINEER	EMBASSY
ABHI	CONSTRUCTION ENGINEER	TEMPLE
ABHI	CONSTRUCTION ENGINEER	AIRPORT
BASU	CONSTRUCTION ENGINEER	COMMERCIAL_BUILDING
BASU	CONSTRUCTION ENGINEER	POLICE_STATION
BASU	CONSTRUCTION ENGINEER	SCHOOL
BASU	CONSTRUCTION ENGINEER	CANTEEN
BASU	CONSTRUCTION ENGINEER	BUS_DEPOT
BASU	CONSTRUCTION ENGINEER	COLLEGE
BASU	CONSTRUCTION ENGINEER	COMPLEX
BASU	CONSTRUCTION ENGINEER	HOSPITAL
BASU	CONSTRUCTION ENGINEER	EMBASSY
BASU	CONSTRUCTION ENGINEER	TEMPLE
BASU	CONSTRUCTION ENGINEER	AIRPORT
CECILIA	FINANCIAL ENGINEER	COMMERCIAL_BUILDING
CECILIA	FINANCIAL ENGINEER	POLICE_STATION
CECILIA	FINANCIAL ENGINEER	SCHOOL
CECILIA	FINANCIAL ENGINEER	HOSTEL
CECILIA	FINANCIAL ENGINEER	CANTEEN
CECILIA	FINANCIAL ENGINEER	BUS_DEPOT
CECILIA	FINANCIAL ENGINEER	COLLEGE
CECILIA	FINANCIAL ENGINEER	HOSPITAL
CECILIA	FINANCIAL ENGINEER	EMBASSY
CECILIA	FINANCIAL ENGINEER	TEMPLE
CECILIA	FINANCIAL ENGINEER	AIRPORT

1.LEFT JOIN

```
MariaDB [sawant]> SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME,PROJECTS.TYPE_OF_PROJECT  
-> FROM EMPLOYEE_INFORMATION  
-> LEFT JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO = PROJECTS.PROJECT_NO;
```

EMPLOYEE_NAME	TYPE_OF_PROJECT
ABHI	COMPLEX
BASU	HOSTEL
CECILIA	COMPLEX
RAGHU	AIRPORT
CHURCHILL	COMMERCIAL_BUILDING
POORVI	COLLEGE
BHATTA	SCHOOL
SHIVU	TEMPLE
MANOJ	EMBASSY
GOURAB	HOSTEL
ASHISH	SCHOOL
DEEPAK	CANTEEN
AMOGH	NULL
MANISH	HOSTEL
CHAITANYA	NULL
PRAVEEN	COMMERCIAL_BUILDING
RAKSHITH	NULL
SNEHA	NULL
AMUL	POLICE_STATION
AKSHAY	HOSPITAL
PRATIK	NULL

2.RIGHT JOIN

```
SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME,PROJECTS.TYPE_OF_PROJECT  
FROM EMPLOYEE_INFORMATION  
RIGHT JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO = PROJECTS.PROJECT_NO;
```

```
MariaDB [sawant]> SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME,PROJECTS.TYPE_OF_PROJECT  
-> FROM EMPLOYEE_INFORMATION  
-> RIGHT JOIN PROJECTS ON EMPLOYEE_INFORMATION.PROJECT_NO = PROJECTS.PROJECT_NO;
```

EMPLOYEE_NAME	TYPE_OF_PROJECT
CHURCHILL	COMMERCIAL_BUILDING
PRAVEEN	COMMERCIAL_BUILDING
AMUL	POLICE_STATION
BHATTA	SCHOOL
ASHISH	SCHOOL
BASU	HOSTEL
GOURAB	HOSTEL
MANISH	HOSTEL
DEEPAK	CANTEEN
NULL	BUS_DEPOT
POORVI	COLLEGE
ABHI	COMPLEX
CECILIA	COMPLEX
AKSHAY	HOSPITAL
MANOJ	EMBASSY
SHIVU	TEMPLE
RAGHU	AIRPORT

```
17 rows in set (0.001 sec)
```

3. FULL/CROSS JOIN

```
SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME,DESIGNATION,PROJECTS.TYPE_OF_PROJECT  
FROM EMPLOYEE_INFORMATION CROSS JOIN PROJECTS;
```

```
MariaDB [sawant]> SELECT EMPLOYEE_INFORMATION.EMPLOYEE_NAME, EMPLOYEE_INFORMATION.DESIGNATION,PROJECTS.TYPE_OF_PROJECT  
-> FROM EMPLOYEE_INFORMATION CROSS JOIN PROJECTS;
```

EMPLOYEE_NAME	DESIGNATION	TYPE_OF_PROJECT
ABHI	CONSTRUCTION ENGINEER	COMMERCIAL_BUILDING
ABHI	CONSTRUCTION ENGINEER	POLICE_STATION
ABHI	CONSTRUCTION ENGINEER	SCHOOL
ABHI	CONSTRUCTION ENGINEER	HOSTEL
ABHI	CONSTRUCTION ENGINEER	CANTEEN
ABHI	CONSTRUCTION ENGINEER	BUS_DEPOT
ABHI	CONSTRUCTION ENGINEER	COLLEGE
ABHI	CONSTRUCTION ENGINEER	COMPLEX
ABHI	CONSTRUCTION ENGINEER	HOSPITAL
ABHI	CONSTRUCTION ENGINEER	EMBASSY
ABHI	CONSTRUCTION ENGINEER	TEMPLE
ABHI	CONSTRUCTION ENGINEER	AIRPORT
BASU	CONSTRUCTION ENGINEER	COMMERCIAL_BUILDING
BASU	CONSTRUCTION ENGINEER	POLICE_STATION
BASU	CONSTRUCTION ENGINEER	SCHOOL
BASU	CONSTRUCTION ENGINEER	HOSTEL
BASU	CONSTRUCTION ENGINEER	CANTEEN
BASU	CONSTRUCTION ENGINEER	BUS_DEPOT
BASU	CONSTRUCTION ENGINEER	COLLEGE
BASU	CONSTRUCTION ENGINEER	COMPLEX
BASU	CONSTRUCTION ENGINEER	HOSPITAL
BASU	CONSTRUCTION ENGINEER	EMBASSY
BASU	CONSTRUCTION ENGINEER	TEMPLE
BASU	CONSTRUCTION ENGINEER	AIRPORT
CECILIA	FINANCIAL ENGINEER	COMMERCIAL_BUILDING
CECILIA	FINANCIAL ENGINEER	POLICE_STATION
CECILIA	FINANCIAL ENGINEER	SCHOOL
CECILIA	FINANCIAL ENGINEER	HOSTEL
CECILIA	FINANCIAL ENGINEER	CANTEEN
CECILIA	FINANCIAL ENGINEER	BUS_DEPOT
CECILIA	FINANCIAL ENGINEER	COLLEGE
CECILIA	FINANCIAL ENGINEER	COMPLEX
CECILIA	FINANCIAL ENGINEER	HOSPITAL
CECILIA	FINANCIAL ENGINEER	EMBASSY
CECILIA	FINANCIAL ENGINEER	TEMPLE
CECILIA	FINANCIAL ENGINEER	AIRPORT

Self Join:

```
SELECT e1.EMPLOYEE_NAME, e2.EMPLOYEE_NAME  
FROM employee_INFORMATION AS e1  
JOIN employee_INFORMATION e2 ON e1.AGE = e2.AGE;
```

```
MariaDB [sawant]> SELECT e1.EMPLOYEE_NAME, e2.EMPLOYEE_NAME  
-> FROM employee_INFORMATION AS e1  
-> JOIN employee_INFORMATION e2 ON e1.AGE = e2.AGE;
```

EMPLOYEE_NAME	EMPLOYEE_NAME
ABHI	ABHI
POORVI	ABHI
MANISH	ABHI
BASU	BASU
GOURAB	BASU
AMOGH	BASU
CECILIA	CECILIA
RAGHU	RAGHU
BHATTA	RAGHU
CHURCHILL	CHURCHILL
CHAITANYA	CHURCHILL
ABHI	POORVI
POORVI	POORVI
MANISH	POORVI
RAGHU	BHATTA
BHATTA	BHATTA
SHIVU	SHIVU
MANOJ	MANOJ
BASU	GOURAB
GOURAB	GOURAB
AMOGH	GOURAB
ASHISH	ASHISH
SNEHA	ASHISH
DEEPAK	DEEPAK
BASU	AMOGH
GOURAB	AMOGH
AMOGH	AMOGH
ABHI	MANISH
POORVI	MANISH
MANISH	MANISH
CHURCHILL	CHAITANYA
CHAITANYA	CHAITANYA
PRAVEEN	PRAVEEN
RAKSHITH	RAKSHITH
ASHISH	SNEHA
SNEHA	SNEHA
AMUL	AMUL
AKSHAY	AKSHAY
PRATIK	PRATIK

SUBQUERY

Subqueries are enclosed within parentheses and can be used in various parts of a SQL statement.

A subquery is a query that is nested within another query.

```
SELECT NAME  
FROM EMPLOYEES  
WHERE PROJECT_NO IN (SELECT PROJECT_NO FROM PROJECTS WHERE EXPECTEDCOST_IN_LAKH_RUPEES > 1000);
```

```
MariaDB [sawant]> SELECT EMPLOYEE_NAME  
-> FROM EMPLOYEE_INFORMATION  
-> WHERE PROJECT_NO IN (SELECT PROJECT_NO FROM PROJECTS WHERE EXPECTEDCOST_IN_LAKH_RUPEES > 1000);
```

```
+-----+  
| EMPLOYEE_NAME |  
+-----+  
| CHURCHILL     |  
| PRAVEEN       |  
| POORVI        |  
| ABHI          |  
| CECILIA       |  
| AKSHAY        |  
| MANOJ         |  
| RAGHU         |  
+-----+
```

```
8 rows in set (0.001 sec)
```


Constraints on the PROJECTS and EMPLOYEES Table:

1.PRIMARY KEY Constraint:

```
CREATE TABLE PROJECTS (  
  PROJECT_NO INT PRIMARY KEY  
  --Other columns...  
);
```

2.UNIQUE Constraint:

```
CREATE TABLE PROJECTS (  
  TYPE_OF_PROJECT VARCHAR(30) UNIQUE,  
  -- Other columns...  
);
```

3.FOREIGN KEY Constraint:

```
CREATE TABLE EMPLOYEES (  
  PROJECT_NO INT,  
  FOREIGN KEY (PROJECT_NO) REFERENCES PROJECTS(PROJECT_NO),  
  -- Other columns...  
);
```

4.NOT NULL Constraint:

```
CREATE TABLE EMPLOYEES (  
  NAME VARCHAR(30) NOT NULL,  
  -- Other columns...  
);
```


5.CHECK Constraint:

```
CREATE TABLE EMPLOYEES (  
  AGE INT CHECK (AGE >= 18),  
  -- Other columns...  
);
```

6.DEFAULT Constraint:

```
CREATE TABLE EMPLOYEES (  
  SALARY_PER_MONTH BIGINT DEFAULT 0,  
  -- Other columns...  
);
```

String Function

❑ CONCAT

```
MariaDB [sawant]> select concat('OWNER NIVEDITA');
+-----+
| concat('OWNER NIVEDITA') |
+-----+
| OWNER NIVEDITA          |
+-----+
```

❑ LOWER

```
MariaDB [sawant]> select LOWER('SAWANT CONSTRUCTION');
+-----+
| LOWER('SAWANT CONSTRUCTION') |
+-----+
| sawant construction          |
+-----+
```

❑ UPPER

```
MariaDB [sawant]> select upper('sawant construction');
+-----+
| upper('sawant construction') |
+-----+
| SAWANT CONSTRUCTION          |
+-----+
```

❑ REVERSE

```
MariaDB [sawant]> select reverse('construction sawant');
+-----+
| reverse('construction sawant') |
+-----+
| tnawas noitcurtsnoc           |
+-----+
```

❑ SUBSTRING

```
MariaDB [sawant]> select substring('sawant construction',2,4);
+-----+
| substring('sawant construction',2,4) |
+-----+
| awan                                  |
+-----+
```

❑ LENGTH

```
MariaDB [sawant]> select length('sawant construction');
+-----+
| length('sawant construction') |
+-----+
|                                | 19 |
+-----+
```

Aggregate Function

❑ Average

```
MariaDB [sawant]> SELECT AVG(AGE)FROM EMPLOYEE_INFORMATION;
+-----+
| AVG(AGE) |
+-----+
| 29.38095238095238 |
+-----+
```

❑ MIN

```
MariaDB [sawant]> SELECT MIN(SALARY_PER_MONTH)FROM EMPLOYEE_INFORMATION;
+-----+
| MIN(SALARY_PER_MONTH) |
+-----+
| 21700 |
+-----+
```

❑ COUNT

```
MariaDB [sawant]> SELECT COUNT(SALARY_PER_MONTH)FROM EMPLOYEE_INFORMATION;
+-----+
| COUNT(SALARY_PER_MONTH) |
+-----+
| 21 |
+-----+
```

❑ SUM

```
MariaDB [sawant]> SELECT SUM(SALARY_PER_MONTH)FROM EMPLOYEE_INFORMATION;
+-----+
| SUM(SALARY_PER_MONTH) |
+-----+
| 660700 |
+-----+
```

❑ MAX

```
MariaDB [sawant]> SELECT MAX(SALARY_PER_MONTH)FROM EMPLOYEE_INFORMATION;
+-----+
| MAX(SALARY_PER_MONTH) |
+-----+
| 54000 |
+-----+
```


An aerial photograph of the Chicago skyline at sunset. The sun is low on the horizon to the left, casting a warm orange glow over the city. The skyline is dense with skyscrapers, including the Willis Tower and the Trump Tower. The city extends to the edge of Lake Michigan on the right.

Thank you