

```
MariaDB [(none)]> show databases;
```

Database
contacts
dbperson
dbperson1
dsml12pm
information_schema
mysql
p_hotel
p_login
p_transport
performance_schema
person
phpmyadmin
piet
test

```
+-----+  
14 rows in set (0.069 sec)
```

```
MariaDB [(none)]> use dsml12pm;
```

```
Database changed
```

```
MariaDB [dsml12pm]> show tables;
```

Tables_in_dsml12pm
fees
new
student

```
+-----+
3 rows in set (0.107 sec)
```

```
MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> ----->>>> ____FOREIGN KEY____
MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> ----->>>> while creating the table
MariaDB [dsml12pm]> ----->>>> in existing table
MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> select * from student;
```

```
+-----+-----+-----+
| sid | name  | age |
+-----+-----+-----+
| 101 | aman  | 20  |
| 102 | rohan | 23  |
| 103 | ram   | 24  |
| 104 | rajat | 21  |
| 105 | simran | 18  |
+-----+-----+-----+
```

```
5 rows in set (0.086 sec)
```

```
MariaDB [dsml12pm]> select * from fees;
```

```
+-----+-----+-----+-----+
| fid | fees | discount | paid |
+-----+-----+-----+-----+
| 101 | 20000 | 1000 | 4000 |
| 102 | 30000 | 2000 | 12000 |
```

103	20000	0	9000
104	25000	0	15000

4 rows in set (0.031 sec)

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> desc student;

Field	Type	Null	Key	Default	Extra
sid	int(5)	NO	PRI	NULL	
name	char(100)	YES		NULL	
age	int(5)	YES		18	

3 rows in set (0.056 sec)

MariaDB [dsml12pm]> desc fees;

Field	Type	Null	Key	Default	Extra
fid	int(5)	YES		NULL	
fees	double	YES		NULL	
discount	double	YES		NULL	
paid	double	YES		NULL	

4 rows in set (0.021 sec)

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> alter table fees add foreign key(fid) references student(sid);  
Query OK, 4 rows affected (0.149 sec)

Records: 4 Duplicates: 0 Warnings: 0

MariaDB [dsml12pm]> desc student;

Field	Type	Null	Key	Default	Extra
sid	int(5)	NO	PRI	NULL	
name	char(100)	YES		NULL	
age	int(5)	YES		18	

3 rows in set (0.016 sec)

MariaDB [dsml12pm]> desc fees;

Field	Type	Null	Key	Default	Extra
fid	int(5)	YES	MUL	NULL	
fees	double	YES		NULL	
discount	double	YES		NULL	
paid	double	YES		NULL	

4 rows in set (0.020 sec)

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> select \* from student;

sid	name	age
101	aman	20
102	rohan	23

103	ram	24
104	rajat	21
105	simran	18

5 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from fees;

fid	fees	discount	paid
101	20000	1000	4000
102	30000	2000	12000
103	20000	0	9000
104	25000	0	15000

4 rows in set (0.001 sec)

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> insert into fees values(105,35000,3000,17000);

Query OK, 1 row affected (0.013 sec)

MariaDB [dsml12pm]> select \* from student;

sid	name	age
101	aman	20
102	rohan	23
103	ram	24
104	rajat	21
105	simran	18

```
+-----+-----+-----+
5 rows in set (0.001 sec)
```

```
MariaDB [dsml12pm]> select * from fees;
```

```
+-----+-----+-----+-----+
| fid  | fees  | discount | paid  |
+-----+-----+-----+-----+
| 101  | 20000 | 1000     | 4000  |
| 102  | 30000 | 2000     | 12000 |
| 103  | 20000 | 0        | 9000  |
| 104  | 25000 | 0        | 15000 |
| 105  | 35000 | 3000     | 17000 |
+-----+-----+-----+-----+
5 rows in set (0.001 sec)
```

```
MariaDB [dsml12pm]> insert into fees values(106,30000,1000,5000);
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails
(`dsml12pm`.`fees`, CONSTRAINT `fees_ibfk_1` FOREIGN KEY (`fid`) REFERENCES
`student` (`sid`))
```

```
MariaDB [dsml12pm]>
```

```
MariaDB [dsml12pm]>
```

```
MariaDB [dsml12pm]> show tables;
```

```
+-----+
| Tables_in_dsml12pm |
+-----+
| fees                |
| new                 |
| student              |
+-----+
3 rows in set (0.001 sec)
```

```

MariaDB [dsml12pm]> create table address(aid int(5), city varchar(100), state
varchar(100), foreign key(aid) references student(sid));
Query OK, 0 rows affected (0.054 sec)

```

```

MariaDB [dsml12pm]> desc address;

```

Field	Type	Null	Key	Default	Extra
aid	int(5)	YES	MUL	NULL	
city	varchar(100)	YES		NULL	
state	varchar(100)	YES		NULL	

3 rows in set (0.021 sec)

```

MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> ----->>>>  _____JOINS_____
MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> ----->>>> inner join
MariaDB [dsml12pm]> ----->>>> left join
MariaDB [dsml12pm]> ----->>>> right join
MariaDB [dsml12pm]> ----->>>> cross join
MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> select * from student;
+-----+-----+-----+
| sid | name  | age  |
+-----+-----+-----+

```

	101		aman		20	
	102		rohan		23	
	103		ram		24	
	104		rajat		21	
	105		simran		18	

+-----+-----+-----+

5 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from fees;

+-----+-----+-----+-----+  
| fid | fees | discount | paid |

+-----+-----+-----+-----+

	101		20000		1000		4000	
	102		30000		2000		12000	
	103		20000		0		9000	
	104		25000		0		15000	
	105		35000		3000		17000	

+-----+-----+-----+-----+

5 rows in set (0.001 sec)

MariaDB [dsml12pm]> delete from fees where fid=104;

Query OK, 1 row affected (0.024 sec)

MariaDB [dsml12pm]> select \* from student;

+-----+-----+-----+

| sid | name | age |

+-----+-----+-----+

	101		aman		20	
	102		rohan		23	
	103		ram		24	



104	rajat	21
105	simran	18

5 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from fees;

fid	fees	discount	paid
101	20000	1000	4000
102	30000	2000	12000
103	20000	0	9000
105	35000	3000	17000

4 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from student inner join fees on student.sid=fees.fid;

sid	name	age	fid	fees	discount	paid
101	aman	20	101	20000	1000	4000
102	rohan	23	102	30000	2000	12000
103	ram	24	103	20000	0	9000
105	simran	18	105	35000	3000	17000

4 rows in set (0.006 sec)

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> select sid, name, fees, paid from student inner join fees on student.sid=fees.fid;

sid	name	fees	paid
101	aman	20000	4000
102	rohan	30000	12000
103	ram	20000	9000
105	simran	35000	17000

4 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from student left join fees on student.sid=fees.fid;

sid	name	age	fid	fees	discount	paid
101	aman	20	101	20000	1000	4000
102	rohan	23	102	30000	2000	12000
103	ram	24	103	20000	0	9000
105	simran	18	105	35000	3000	17000
104	rajat	21	NULL	NULL	NULL	NULL

5 rows in set (0.002 sec)

MariaDB [dsml12pm]> select \* from fees left join student on student.sid=fees.fid;

fid	fees	discount	paid	sid	name	age
101	20000	1000	4000	101	aman	20
102	30000	2000	12000	102	rohan	23
103	20000	0	9000	103	ram	24
105	35000	3000	17000	105	simran	18

```
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.003 sec)
```

```
MariaDB [dsml12pm]> select * from student right join fees on student.sid=fees.fid;
```

```
+-----+-----+-----+-----+-----+-----+-----+
| sid  | name  | age  | fid  | fees  | discount | paid  |
+-----+-----+-----+-----+-----+-----+-----+
| 101  | aman  | 20   | 101  | 20000 | 1000     | 4000  |
| 102  | rohan | 23   | 102  | 30000 | 2000     | 12000 |
| 103  | ram   | 24   | 103  | 20000 | 0        | 9000  |
| 105  | simran | 18   | 105  | 35000 | 3000     | 17000 |
+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.001 sec)
```

```
MariaDB [dsml12pm]> select * from fees right join student on student.sid=fees.fid;
```

```
+-----+-----+-----+-----+-----+-----+-----+
| fid  | fees  | discount | paid  | sid  | name  | age  |
+-----+-----+-----+-----+-----+-----+-----+
| 101  | 20000 | 1000     | 4000  | 101  | aman  | 20   |
| 102  | 30000 | 2000     | 12000 | 102  | rohan | 23   |
| 103  | 20000 | 0        | 9000  | 103  | ram   | 24   |
| 105  | 35000 | 3000     | 17000 | 105  | simran | 18   |
| NULL | NULL  | NULL     | NULL  | 104  | rajat | 21   |
+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.001 sec)
```

```
MariaDB [dsml12pm]> select * from student cross join fees;
```

```
+-----+-----+-----+-----+-----+-----+-----+
| sid  | name  | age  | fid  | fees  | discount | paid  |
+-----+-----+-----+-----+-----+-----+-----+
```

101	aman	20	101	20000	1000	4000
101	aman	20	102	30000	2000	12000
101	aman	20	103	20000	0	9000
101	aman	20	105	35000	3000	17000
102	rohan	23	101	20000	1000	4000
102	rohan	23	102	30000	2000	12000
102	rohan	23	103	20000	0	9000
102	rohan	23	105	35000	3000	17000
103	ram	24	101	20000	1000	4000
103	ram	24	102	30000	2000	12000
103	ram	24	103	20000	0	9000
103	ram	24	105	35000	3000	17000
104	rajat	21	101	20000	1000	4000
104	rajat	21	102	30000	2000	12000
104	rajat	21	103	20000	0	9000
104	rajat	21	105	35000	3000	17000
105	simran	18	101	20000	1000	4000
105	simran	18	102	30000	2000	12000
105	simran	18	103	20000	0	9000
105	simran	18	105	35000	3000	17000

+-----+-----+-----+-----+-----+-----+-----+  
20 rows in set (0.001 sec)

```

MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> ----->>>>  _____NESTED QUERY_____
MariaDB [dsml12pm]>
MariaDB [dsml12pm]>
MariaDB [dsml12pm]> select * from student;
+-----+-----+-----+

```

sid	name	age
101	aman	20
102	rohan	23
103	ram	24
104	rajat	21
105	simran	18

5 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from fees;

fid	fees	discount	paid
101	20000	1000	4000
102	30000	2000	12000
103	20000	0	9000
105	35000	3000	17000

4 rows in set (0.001 sec)

MariaDB [dsml12pm]> insert into address values (101,'jaipur','raj'),  
 (102,'alwar','raj'), (103,'jaipur','raj'), (104,'alwar','raj');  
 Query OK, 4 rows affected (0.011 sec)  
 Records: 4 Duplicates: 0 Warnings: 0

MariaDB [dsml12pm]>  
 MariaDB [dsml12pm]> select \* from student;

sid	name	age
-----	------	-----

101	aman	20
102	rohan	23
103	ram	24
104	rajat	21
105	simran	18

5 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from fees;

fid	fees	discount	paid
101	20000	1000	4000
102	30000	2000	12000
103	20000	0	9000
105	35000	3000	17000

4 rows in set (0.001 sec)

MariaDB [dsml12pm]> select \* from address;

aid	city	state
101	jaipur	raj
102	alwar	raj
103	jaipur	raj
104	alwar	raj

4 rows in set (0.001 sec)

MariaDB [dsml12pm]> select aid from address where city='jaipur';

aid
101
103

2 rows in set (0.003 sec)

MariaDB [dsml12pm]> select fid from fees where paid<5000 and fid in(101,103);

fid
101

1 row in set (0.004 sec)

MariaDB [dsml12pm]> select name from student where sid in (101);

name
aman

1 row in set (0.001 sec)

MariaDB [dsml12pm]> select name from student where sid in (select fid from fees where paid<5000 and fid in(select aid from address where city='jaipur'));

name
------

```
+-----+
```

```
| aman |
```

```
+-----+
```

```
1 row in set (0.001 sec)
```

```
MariaDB [dsml12pm]>
```

```
MariaDB [dsml12pm]>
```

```
MariaDB [dsml12pm]> ----->>>> _____GROUP BY CLAUSE_____
```

```
MariaDB [dsml12pm]>
```

```
MariaDB [dsml12pm]>
```

```
MariaDB [dsml12pm]> select * from student;
```

```
+-----+-----+-----+
```

```
| sid | name | age |
```

```
+-----+-----+-----+
```

```
| 101 | aman | 20 |
```

```
| 102 | rohan | 23 |
```

```
| 103 | ram | 24 |
```

```
| 104 | rajat | 21 |
```

```
| 105 | simran | 18 |
```

```
+-----+-----+-----+
```

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

```
MariaDB [dsml12pm]> insert into student values (106, 'sachin',20), (107,'naman',23),  
(108,'himanshu',18);
```

```
Query OK, 3 rows affected (0.008 sec)
```

```
Records: 3 Duplicates: 0 Warnings: 0
```

```
MariaDB [dsml12pm]> select * from student;
```

```
+-----+-----+-----+
```

```
| sid | name | age |
```



id	name	age
101	aman	20
102	rohan	23
103	ram	24
104	rajat	21
105	simran	18
106	sachin	20
107	naman	23
108	himanshu	18

8 rows in set (0.003 sec)

MariaDB [dsml12pm]> select \* from student group by age;

sid	name	age
105	simran	18
101	aman	20
104	rajat	21
102	rohan	23
103	ram	24

5 rows in set (0.002 sec)

MariaDB [dsml12pm]> select age, count(\*) from student group by age;

age	count(*)
18	2
20	2

	21		1	
	23		2	
	24		1	

+-----+-----+

5 rows in set (0.005 sec)

MariaDB [dsml12pm]> select age, count(\*) as number\_of\_students from student group by age;

+-----+-----+

age	number_of_students
-----	--------------------

+-----+-----+

	18		2	
--	----	--	---	--

	20		2	
--	----	--	---	--

	21		1	
--	----	--	---	--

	23		2	
--	----	--	---	--

	24		1	
--	----	--	---	--

+-----+-----+

5 rows in set (0.002 sec)

MariaDB [dsml12pm]>

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> ----->>>> \_\_\_\_HAVING CLAUSE\_\_\_\_

MariaDB [dsml12pm]>

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> select age, count(\*) as number\_of\_students from student group by age having number\_of\_student > 1;

+-----+-----+

age	number_of_students
-----	--------------------

+-----+-----+

	18					2	
	20					2	
	23					2	

+-----+-----+-----+

3 rows in set (0.001 sec)

MariaDB [dsml12pm]>

MariaDB [dsml12pm]>

MariaDB [dsml12pm]> ----->>>> PYTHON DATABASE CONNECTIVITY

MariaDB [dsml12pm]>

MariaDB [dsml12pm]>