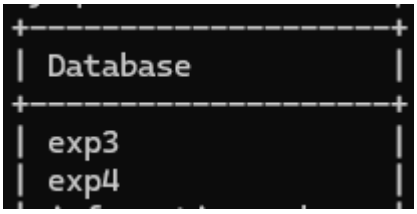
Assignment 4

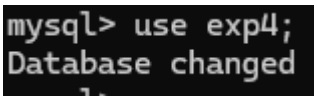
Creating db and tables

```
create database exp4;
```



```
+--------------------+
| Database           |
+--------------------+
| exp3               |
| exp4               |
```

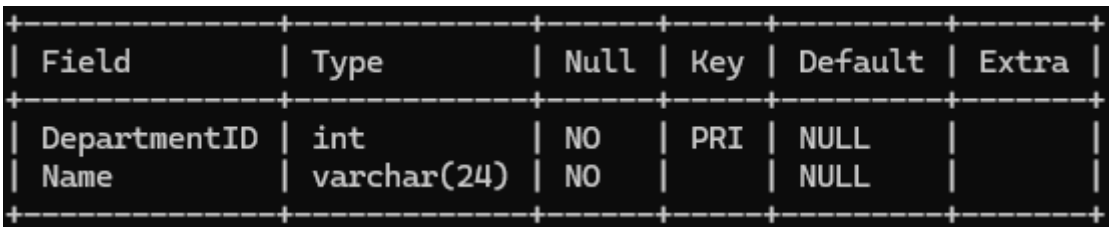
```
use exp4;
```



```
mysql> use exp4;
Database changed
```

creating department table

```
create table Department(
    DepartmentID int not null primary key,
    Name varchar(24) not null
);
```



```
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| DepartmentID | int         | NO   | PRI | NULL    |       |
| Name         | varchar(24) | NO   |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
```

creating department student

```
create table Student(
    StudentID int not null primary key,
    Name varchar(24) not null,
    Age int not null,
    DepartmentID int not null
);
```

Field	Type	Null	Key	Default	Extra
StudentID	int	NO	PRI	NULL	
Name	varchar(24)	NO		NULL	
Age	int	NO		NULL	
DepartmentID	int	NO		NULL	

creating department marks

```
create table Marks(
    MarksID int not null primary key,
    StudentID int not null,
    Subject varchar(24) not null,
    Marks int not null
);
```

Field	Type	Null	Key	Default	Extra
MarksID	int	NO	PRI	NULL	
StudentID	int	NO		NULL	
Subject	varchar(24)	NO		NULL	
Marks	int	NO		NULL	

inserting data in department table

```
insert into Department (DepartmentID,Name) values
(1,"Computer Science"),
(2,"Mathematics"),
(3,"Physics");
```

DepartmentID	Name
1	Computer Science
2	Mathematics
3	Physics

inserting data in student table

```
insert into Student (StudentID,Name,Age,DepartmentID) values
(1,"Amit",20,1),
(2,"Riya",22,2),
(3,"Karan",21,1),
```

```
(4,"Neha",23,3),
(5,"Arjun",20,2);
```

StudentID	Name	Age	DepartmentID
1	Amit	20	1
2	Riya	22	2
3	Karan	21	1
4	Neha	23	3
5	Arjun	20	2

inserting data in marks table

```
insert into Marks (MarksID,StudentID,Subject,Marks) values
(1,1,"DBMS",85),
(2,1,"AI",90),
(3,2,"DBMS",75),
(4,2,"AI",80),
(5,3,"DBMS",88),
(6,4,"AI",92),
(7,5,"DBMS",70);
```

MarksID	StudentID	Subject	Marks
1	1	DBMS	85
2	1	AI	90
3	2	DBMS	75
4	2	AI	80
5	3	DBMS	88
6	4	AI	92
7	5	DBMS	70

Questions

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1. Retrieve all students along with their department names.

```
select s.*,d.Name as DepartmentName
from Student s
join Department d
on s.DepartmentID = d.DepartmentID;
```

StudentID	Name	Age	DepartmentID	DepartmentName
1	Amit	20	1	Computer Science
2	Riya	22	2	Mathematics
3	Karan	21	1	Computer Science
4	Neha	23	3	Physics
5	Arjun	20	2	Mathematics

---

2. Find the average marks obtained by each student.

```
select s.Name,avg(m.Marks)
from Student s
join Marks m
on s.StudentID = m.StudentID
group by s.StudentID;
```

Name	avg(m.Marks)
Amit	87.5000
Riya	77.5000
Karan	88.0000
Neha	92.0000
Arjun	70.0000

---

3. Find the maximum marks in each subject.

```
select Subject,max(Marks)
from Marks
group by Subject;
```

Subject	max(Marks)
DBMS	88
AI	92

---

4. List students who scored more than 80 in all subject.

```
select s.StudentID,s.Name,s.Age,s.DepartmentID
from Student s
join Marks m
```

```
on s.StudentID = m.StudentID
group by s.StudentID, s.Name, s.Age, s.DepartmentID
having min(m.Marks) > 80;
```

StudentID	Name	Age	DepartmentID
1	Amit	20	1
3	Karan	21	1
4	Neha	23	3

---

5. Retrieve all students ordered by their average marks in descending order.

```
select s.*,avg(m.Marks) as AverageMarks
from Student s
join Marks m
on s.StudentID = m.StudentID
group by m.StudentID
order by AverageMarks desc;
```

StudentID	Name	Age	DepartmentID	AverageMarks
4	Neha	23	3	92.0000
3	Karan	21	1	88.0000
1	Amit	20	1	87.5000
2	Riya	22	2	77.5000
5	Arjun	20	2	70.0000

---

6. Find the average marks scored by students in each department.

```
select d.Name as DepartmentName, avg(m.Marks) as AverageMarks
from Student s
join Department d on s.DepartmentID = d.DepartmentID
join Marks m on s.StudentID = m.StudentID
group by d.DepartmentID;
```

DepartmentName	AverageMarks
Computer Science	87.6667
Mathematics	75.0000
Physics	92.0000

---

7. Display students who have not received any marks yet.

```
select s.StudentID,s.Name,s.Age,s.DepartmentID
from Student s
right join Marks m
on s.StudentID = m.StudentID
where m.MarksID is NULL;
```

```
mysql> select s.StudentID,s.Name,s.Age,s.DepartmentID
    ->     from Student s
    ->     right join Marks m
    ->     on s.StudentID = m.StudentID
    ->     where m.MarksID is NULL;
Empty set (0.00 sec)
```

---

8. Retrieve department names along with the number of students enrolled in each department.

```
select d.Name as DepartmentName,count(s.StudentID) as Count
from Student s
right join Department d
on s.DepartmentID = d.DepartmentID
group by d.DepartmentID;
```

DepartmentName	Count
Computer Science	2
Mathematics	2
Physics	1

---

9. Find the student with the highest marks in AI subject.

```
select s.*,m.Marks
from Student s
join Marks m
```

```
on s.StudentID = m.StudentID
where m.Subject = "AI"
order by m.Marks desc
limit 1;
```

StudentID	Name	Age	DepartmentID	Marks
4	Neha	23	3	92

---

10. Display all students along with their average marks (if any), showing 0 where marks are not available.

```
select s.*,coalesce(avg(m.Marks),0) as AvgMarks
from Student s
join Marks m
on s.StudentId = m.StudentID
group by m.StudentID;
```

StudentID	Name	Age	DepartmentID	AvgMarks
1	Amit	20	1	87.5000
2	Riya	22	2	77.5000
3	Karan	21	1	88.0000
4	Neha	23	3	92.0000
5	Arjun	20	2	70.0000