Part A – Table Creation

1. Create a table **Department** with the following fields:
    - dept_id (Primary Key)
    - dept_name

```
11 •  create database Assignment1;
12 •  use  Assignment1;
13 •  create table Department(dept_id int,dept_name varchar(40));
14 •  insert into Department values(1,'CSE'),(2,'IT'),(3,'ECE'),(4,'MECH'),(5,'CE');
15 •  desc Department;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
dept_id	int	NO	PRI	NULL	
dept_name	varchar(40)	YES		NULL	

2. Create a table **Employee** with the following fields:
    - emp_id (Primary Key)
    - emp_name
    - salary
    - dept_id (Foreign Key referencing Department)

```
18 •  create table Employee(emp_id int primary key,emp_name varchar(40),salary int,dept_id int, foreign key(dept_id) references Department(dept_id));
19 •  desc Employee;
20 •  select * from Employee;
21 •  desc Department;
22 •  insert into Employee values(11,'Tom',10000,1),(12,'Jerry',20000,2),(13,'Tim',48000,1),(14,'Mice',68000,4);
23
```

esult Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
emp_id	int	NO	PRI	NULL	
emp_name	varchar(40)	YES		NULL	
salary	int	YES		NULL	
dept_id	int	YES	MUL	NULL	

Part B – Data Insertion

3. Insert at least 3 departments and 5 employees into the respective tables.

```
11 •  create database Assignment1;
12 •  use  Assignment1;
13 •  create table Department(dept_id int,dept_name varchar(40));
14 •  insert into Department values(1,'CSE'),(2,'IT'),(3,'ECE'),(4,'MECH'),(5,'CE');
15 •  desc Department;
16 •  select * from Department;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

dept_id	dept_name
1	CSE
2	IT
3	ECE
4	MECH
5	CE

Department 2

Output

Action Output

#	Time	Action	Message
2	21:35:06	create database Assignment1	1 row(s) affected
3	21:35:20	use Assignment1	0 row(s) affected
4	21:36:06	create table Department(dept_id int,dept_name varchar(40))	0 row(s) affected
5	21:38:12	insert into Department values(1,'CSE'),(2,'IT'),(3,'ECE'),(4,'MECH'),(5,'CE')	5 row(s) affected Rec
6	21:38:24	desc Department	2 row(s) returned
7	21:39:12	select * from Department LIMIT 0, 1000	5 row(s) returned

```
20 •  desc Department;
21 •  insert into Employee values(11,'Tom',10000,1),(12,'Jerry',20000,2),(13,'Tim',48000,1),(14,'Mice',68000,4);
22 •  insert into Employee values(15,'Ana',30000,3),(16,'Bella',8800,5);
23 •  select * from Employee;
```

esult Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

emp_id	emp_name	salary	dept_id
11	Tom	10000	1
12	Jerry	20000	2
13	Tim	48000	1
14	Mice	68000	4
15	Ana	30000	3
16	Bella	8800	5
NULL	NULL	NULL	NULL

Part C – Queries to Solve

4. Display all employees with their department names.

```
25 •  select emp_name, dept_name from Employee as e inner join Department as d on e.dept_id=d.dept_id;
26
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

emp_name	dept_name
Tom	CSE
Tim	CSE
Jerry	IT
Ana	ECE
Mice	MECH
Bella	CE

5. Find employees who work in the IT department.

```
29 •  select emp_name from Employee as e inner join Department as d on e.dept_id=d.dept_id where dept_name='IT';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

emp_name
Jerry
Dora
Liz

6. List department names along with the number of employees in each department.

```
31    -- 6.  List department names along with the number of employees in each department.
32 •  select count(emp_name),dept_name from Employee as e inner join Department as d on e.dept_id=d.dept_id group by dept_name;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

count(emp_name)	dept_name
2	CSE
3	IT
1	ECE
1	MECH
1	CE

7. Add a new employee 'Meena' in department 'Finance'.

```
47 •  insert into Employee(emp_id, emp_name, salary, dept_id) value(22,'Meena',79000,8);
48 •  select e.*,d.dept_name from Department as d left join Employee as e on d.dept_id=e.dept_id;
49
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

emp_id	emp_name	salary	dept_id	dept_name
11	Tom	10000	1	CSE
13	Tim	48000	1	CSE
12	Jerry	20000	2	IT
17	Dora	29000	2	IT
18	Liz	78000	2	IT
15	Ana	30000	3	ECE
14	Mice	68000	4	MECH
16	Bella	8800	5	CE
NULL	NULL	NULL	NULL	IT
NULL	NULL	NULL	NULL	IT
19	Luke	90000	8	Finanace
22	Meena	79000	8	Finanace

Result 4

8. Try inserting an employee with a non-existing department id (say dept_id = 10). What happens? Why?

```
50 •  insert into Employee(emp_id, emp_name, salary, dept_id) value(29,'Micky',9000,10);
51
```

Action Output

#	Time	Action	Message
10	13:58:50	select e.*,d.dept_name from Department as d left join Employee as e on d.dept_id=e.dept_id LIMIT 0, 1000	12 row(s) returned
11	14:04:06	insert into Employee(emp_id, emp_name, salary, dept_id) value(29,'Micky',9000,10)	Error Code: 1452. Cannot add or update a child row: a foreign key constraint fails (`assignment1`.`employee`,

9. Delete the Finance department. What happens to employees in that department?

```
52 •  delete from Department where dept_name='Finance';
53 •  select * from Employee;
```

Result Grid | Filter Rows: | Edit: | Export/Im

emp_id	emp_name	salary	dept_id
11	Tom	10000	1
12	Jerry	20000	2
13	Tim	48000	1
14	Mice	68000	4
15	Ana	30000	3
16	Bella	8800	5
17	Dora	29000	2
18	Liz	78000	2
19	Luke	90000	8
20	Anie	60000	NULL
21	Meenaa	28000	NULL
22	Meena	79000	8
29	Micky	9000	8
NULL	NULL	NULL	NULL

Part D – Advanced Tasks

10. Modify the **Employee** table so that if a department is deleted, all its employees are also deleted (ON DELETE CASCADE).

```
create database Assign1;
use Assign1;
create table department(dept_id int primary key,dept_name varchar(40));
insert into department values(1,'CSE'),(2,'IT'),(3,'ECE'),(4,'MECH');
desc department;
select * from department;
create table employee(emp_id int primary key,emp_name varchar(40),salary int,dept_id int, foreign key(dept_id) references Department(dept_id) on delete cascade);
insert into employee values(11,'Tom',10000,1),(12,'Jerry',20000,2),(13,'Tim',48000,1),(14,'Mice',68000,4);
desc employee;
desc department;
select * from employee;
-- 10.  Modify the Employee table so that if a department is deleted, all its employees are also deleted (ON DELETE CASCADE).
insert into Department values(1,'CSE'),(2,'IT'),(3,'ECE'),(4,'MECH'),(6,'IT'),(7,'Finance');
insert into Employee values(11,'Tom',10000,1),(12,'Jerry',20000,2),(13,'Tim',48000,1),(16,'Bella',8800,2),(17,'Dora',29000,4),(18,'Meena',78000,4);
select  Employee.emp_name, Department.dept_name from Employee join Department on Employee.dept_id = Department.dept_id;
delete from Department where dept_id=3;
select * from employee;
select * from department;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

emp_id	emp_name	salary	dept_id
11	Tom	10000	1
12	Jerry	20000	2
13	Tim	48000	1
14	Mice	68000	4
NULL	NULL	NULL	NULL

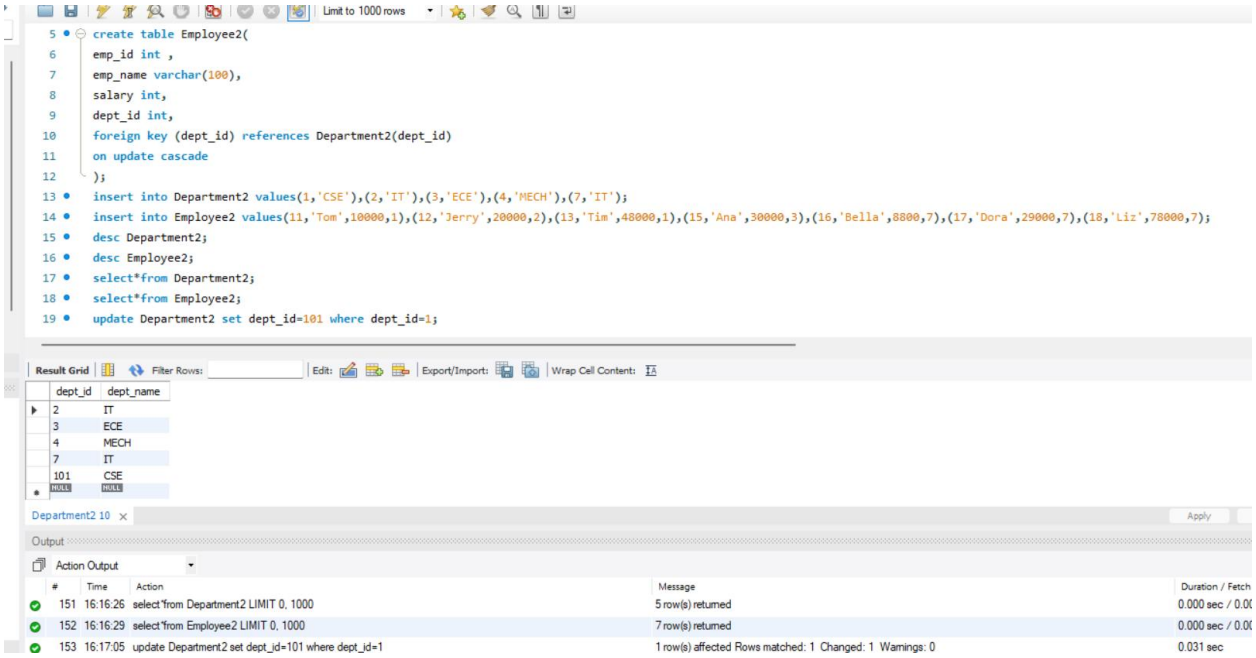
11. Verify the above by deleting the Finance department again.

```
delete from department where dept_name='Finance';
select * from department;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

dept_id	dept_name
1	CSE
2	IT
4	MECH
NULL	NULL

12. Modify the **Employee** table so that if the department_id in **Department** is updated, it should also update automatically in the **Employee** table (ON UPDATE CASCADE).



```
create table Employee2(
emp_id int ,
emp_name varchar(100),
salary int,
dept_id int,
foreign key (dept_id) references Department2(dept_id)
on update cascade
);
insert into Department2 values(1,'CSE'),(2,'IT'),(3,'ECE'),(4,'MECH'),(7,'IT');
insert into Employee2 values(11,'Tom',10000,1),(12,'Jerry',20000,2),(13,'Tim',48000,1),(15,'Ana',30000,3),(16,'Bella',8800,7),(17,'Dora',29000,7),(18,'Liz',78000,7);
desc Department2;
desc Employee2;
select*from Department2;
select*from Employee2;
update Department2 set dept_id=101 where dept_id=1;
```

Result Grid

dept_id	dept_name
2	IT
3	ECE
4	MECH
7	IT
101	CSE
NULL	NULL

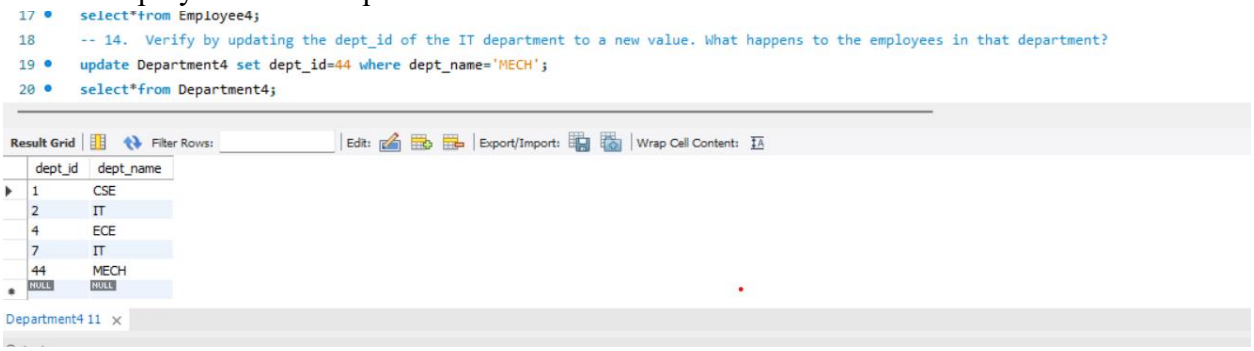
Department2 10

Output

Action Output

#	Time	Action	Message	Duration / Fetch
151	16:16:26	select*from Department2 LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.0
152	16:16:29	select*from Employee2 LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.0
153	16:17:05	update Department2 set dept_id=101 where dept_id=1	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.031 sec

13. Verify by updating the dept_id of the IT department to a new value. What happens to the employees in that department?



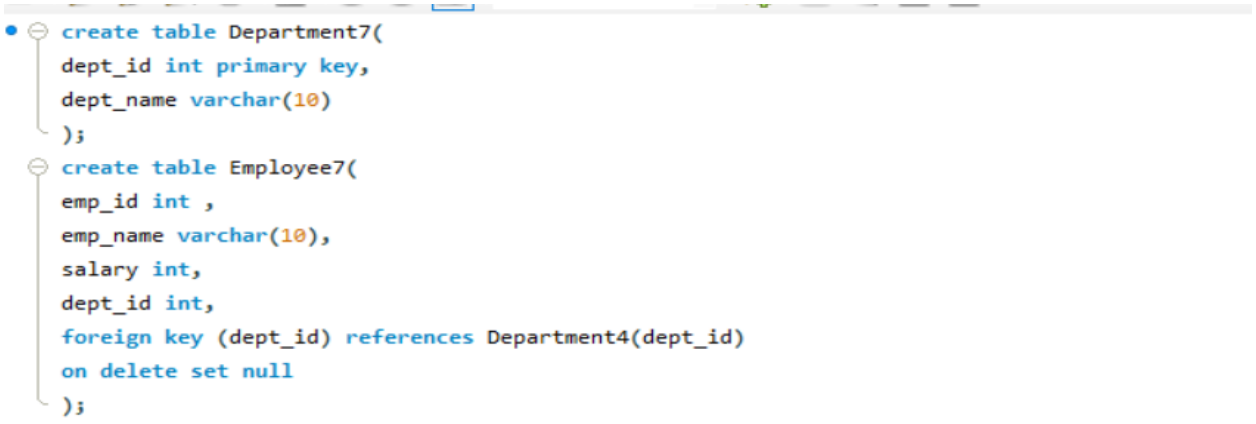
```
select*from Employee4;
-- 14.  Verify by updating the dept_id of the IT department to a new value. What happens to the employees in that department?
update Department4 set dept_id=44 where dept_name='MECH';
select*from Department4;
```

Result Grid

dept_id	dept_name
1	CSE
2	IT
4	ECE
7	IT
44	MECH
NULL	NULL

Department4 11

14. Change the Foreign Key constraint so that if a department is deleted, employees should have their dept_id set to NULL (ON DELETE SET NULL).



```
create table Department7(
dept_id int primary key,
dept_name varchar(10)
);
create table Employee7(
emp_id int ,
emp_name varchar(10),
salary int,
dept_id int,
foreign key (dept_id) references Department4(dept_id)
on delete set null
);
```

15. Test the above by deleting the HR department. What happens to the employees under HR?

```
4   );
5   create table Employee7(
6   emp_id int ,
7   emp_name varchar(10),
8   salary int,
9   dept_id int,
10  foreign key (dept_id) references Department4(dept_id)
11  on delete set null
12  );
13  insert into Department7 values(1,'CSE'),(2,'IT'),(4,'ECE'),(3,'MECH'),(7,'HR');
14  insert into Employee7 values(1,'Tom',10000,1),(2,'Jerry',20000,2),(4,'Tim',48000,1),(3,'Ana',40000,4),(6,'Bella',8800,7),(7,'Dora',29000,7),(8,'Liz',78000,7);
15  desc Department7;
16  desc Employee7;
17  delete from department7 where dept_name='HR';
18  select*from Department7;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

dept_id	dept_name
1	CSE
2	IT
3	MECH
4	ECE
NULL	NULL

Department7 9

Output

Action Output

#	Time	Action	Message
241	17:27:49	delete from department7 where dept_name='HR'	1 row(s) affected
242	17:27:54	select*from Department7 LIMIT 0, 1000	4 row(s) returned