1)Create 3 tables named students,department,year
2)student should contain relationship to both department and year
4)store 5 students for each department

```
mysql> create table department(id int,name char(40));
Query OK, 0 rows affected (0.04 sec)

mysql> insert into department values(1,'CSE');
Query OK, 1 row affected (0.01 sec)

mysql> insert into department values(2,'CSE_DS');
Query OK, 1 row affected (0.02 sec)

mysql> insert into department values(3,'CSE_AI_ML');
Query OK, 1 row affected (0.01 sec)

mysql> insert into department values(4,'ECE');
Query OK, 1 row affected (0.01 sec)

mysql> insert into department values(5,'EEE');
Query OK, 1 row affected (0.01 sec)

mysql> select * from department;
+------+-----------+
| id   | name      |
+------+-----------+
|    1 | CSE       |
|    2 | CSE_DS    |
|    3 | CSE_AI_ML |
|    4 | ECE       |
|    5 | EEE       |
+------+-----------+
5 rows in set (0.00 sec)

mysql> desc department;
+-------+----------+------+-----+---------+-------+
| Field | Type     | Null | Key | Default | Extra |
+-------+----------+------+-----+---------+-------+
| id    | int      | YES  |     | NULL    |       |
| name  | char(40) | YES  |     | NULL    |       |
+-------+----------+------+-----+---------+-------+
2 rows in set (0.03 sec)

mysql> alter table department add primary key (id);
Query OK, 0 rows affected (0.10 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc department;
+-------+----------+------+-----+---------+-------+
| Field | Type     | Null | Key | Default | Extra |
+-------+----------+------+-----+---------+-------+
| id    | int      | NO   | PRI | NULL    |       |
| name  | char(40) | YES  |     | NULL    |       |
+-------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)


mysql> create table years(y_no int primary key,y_name char(40) not null);
Query OK, 0 rows affected (0.04 sec)

mysql> desc years
    -> ;
+--------+----------+------+-----+---------+-------+
| Field  | Type     | Null | Key | Default | Extra |
```

```
+--------+----------+------+-----+---------+-------+
| y_no   | int      | NO   | PRI | NULL    |       |
| y_name | char(40) | NO   |     | NULL    |       |
+--------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)
mysql> insert into years values(1,"1st year");
Query OK, 1 row affected (0.02 sec)

mysql> insert into years values(2,"2nd year");
Query OK, 1 row affected (0.02 sec)

mysql> insert into years values(3,"3rd year");
Query OK, 1 row affected (0.01 sec)

mysql> insert into years values(4,"4th year");
Query OK, 1 row affected (0.01 sec)

mysql> select * from years;
+------+----------+
| y_no | y_name   |
+------+----------+
|    1 | 1st year |
|    2 | 2nd year |
|    3 | 3rd year |
|    4 | 4th year |
+------+----------+
4 rows in set (0.00 sec)

mysql> desc years;
+--------+----------+------+-----+---------+-------+
| Field  | Type     | Null | Key | Default | Extra |
+--------+----------+------+-----+---------+-------+
| y_no   | int      | NO   | PRI | NULL    |       |
| y_name | char(40) | NO   |     | NULL    |       |
+--------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)
mysql> create table student(rollno int primary key,name char(40),age int,dept
int ,s_year int);
Query OK, 0 rows affected (0.04 sec)

mysql> alter table student add foreign key (dept) references department (id);
Query OK, 0 rows affected (0.08 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> alter table student add foreign key (s_year) references years (y_no);
Query OK, 0 rows affected (0.08 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc student;
+--------+----------+------+-----+---------+-------+
| Field  | Type     | Null | Key | Default | Extra |
+--------+----------+------+-----+---------+-------+
| rollno | int      | NO   | PRI | NULL    |       |
| name   | char(40) | YES  |     | NULL    |       |
| age    | int      | YES  |     | NULL    |       |
| dept   | int      | YES  | MUL | NULL    |       |
| s_year | int      | YES  | MUL | NULL    |       |
+--------+----------+------+-----+---------+-------+
5 rows in set (0.00 sec)

mysql> alter table student modify name char(40) not null;
Query OK, 0 rows affected (0.08 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> desc student;
+--------+----------+------+-----+---------+-------+
| Field  | Type     | Null | Key | Default | Extra |
+--------+----------+------+-----+---------+-------+
| rollno | int      | NO   | PRI | NULL    |       |
| name   | char(40) | NO   |     | NULL    |       |
| age    | int      | YES  |     | NULL    |       |
| dept   | int      | YES  | MUL | NULL    |       |
| s_year | int      | YES  | MUL | NULL    |       |
+--------+----------+------+-----+---------+-------+
5 rows in set (0.00 sec)
mysql> insert into student values(63,'Geeth Sai',20,2,3);
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO student (rollno, name, age, dept, s_year) VALUES
    -> (1, 'Alice', 20, 1, 1),
    -> (2, 'Bob', 21, 1, 2),
    -> (3, 'Charlie', 22, 1, 3),
    -> (4, 'David', 23, 1, 4),
    -> (5, 'Eve', 20, 1, 1);
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
mysql> INSERT INTO student (rollno, name, age, dept, s_year) VALUES
    -> (6, 'Faythe', 21, 2, 2),
    -> (7, 'Grace', 22, 2, 3),
    -> (8, 'Heidi', 23, 2, 4),
    -> (9, 'Ivan', 20, 2, 1),
    -> (10, 'Judy', 21, 2, 2);
Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
mysql> INSERT INTO student (rollno, name, age, dept, s_year) VALUES
    -> (11, 'Mallory', 22, 3, 3),
    -> (12, 'Niaj', 23, 3, 4),
    -> (13, 'Olivia', 20, 3, 1),
    -> (14, 'Peggy', 21, 3, 2),
    -> (15, 'Sybil', 22, 3, 3);
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
mysql> INSERT INTO student (rollno, name, age, dept, s_year) VALUES
    -> (16, 'Trent', 23, 4, 4),
    -> (17, 'Victor', 20, 4, 1),
    -> (18, 'Walter', 21, 4, 2),
    -> (19, 'Xena', 22, 4, 3),
    -> (20, 'Yolanda', 23, 4, 4);
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
mysql> INSERT INTO student (rollno, name, age, dept, s_year) VALUES
    -> (21, 'Zara', 20, 5, 1),
    -> (22, 'Amy', 21, 5, 2),
    -> (23, 'Brian', 22, 5, 3),
    -> (24, 'Clara', 23, 5, 4),
    -> (25, 'Dylan', 20, 5, 1);
Query OK, 5 rows affected (0.02 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

5)write a query to display students from CSE department

```
mysql> select * from student where dept IN(select id from department where
name="CSE_DS");
+--------+-----------+------+------+--------+
| rollno | name      | age  | dept | s_year |
+--------+-----------+------+------+--------+
|      6 | Faythe    |   21 |    2 |      2 |
|      7 | Grace     |   22 |    2 |      3 |
|      8 | Heidi     |   23 |    2 |      4 |
|      9 | Ivan      |   20 |    2 |      1 |
|     10 | Judy      |   21 |    2 |      2 |
|     63 | Geeth Sai |   20 |    2 |      3 |
+--------+-----------+------+------+--------+
6 rows in set (0.00 sec)

6)write a query to display only deptname using student table
mysql> select d.name from department d where d.id = ANY(select
    -> s.dept from student s);
+-----------+
| name      |
+-----------+
| CSE       |
| CSE_DS    |
| CSE_AI_ML |
| ECE       |
| EEE       |
+-----------+
5 rows in set (0.01 sec)


7)write a query to display students sorted by dept and firstname
mysql> SELECT s.name AS firstname, d.name AS dept
    -> FROM student s
    -> INNER JOIN department d ON s.dept = d.id
    -> ORDER BY dept, s.name;
+-----------+-----------+
| firstname | dept      |
+-----------+-----------+
| Alice     | CSE       |
| Bob       | CSE       |
| Charlie   | CSE       |
| David     | CSE       |
| Eve       | CSE       |
| Mallory   | CSE_AI_ML |
| Niaj      | CSE_AI_ML |
| Olivia    | CSE_AI_ML |
| Peggy     | CSE_AI_ML |
| Sybil     | CSE_AI_ML |
| Faythe    | CSE_DS    |
| Geeth Sai | CSE_DS    |
| Grace     | CSE_DS    |
| Heidi     | CSE_DS    |
| Ivan      | CSE_DS    |
| Judy      | CSE_DS    |
| Trent     | ECE       |
| Victor    | ECE       |
| Walter    | ECE       |
| Xena      | ECE       |
| Yolanda   | ECE       |
| Amy       | EEE       |
| Brian     | EEE       |
| Clara     | EEE       |
| Dylan     | EEE       |
| Zara      | EEE       |
```

```
+-----------+-----------+
26 rows in set (0.02 sec)
```

3)use chatgpt and ask like "this is my table in mysql how can i create same in mongodb"

1.Using Embedding (not the best for normalized data but can be simpler):

```
{
 "_id": ObjectId(),
 "first_name": "Srikanth",
 "last_name": "Thirumani",
 "department": {
 "dept_id": 1,
 "dept_name": "CSE"
 },
 "year": {
 "year_id": 1,
 "year_name": "First"
 }
}
```

2.Using References (more similar to normalized SQL structure):

Department Collection

```
{
 "_id": ObjectId(),
 "dept_id": 1,
 "dept_name": "CSE"
}
```

Year Collection

```
{
 "_id": ObjectId(),
 "year_id": 1,
 "year_name": "First"
}
```

Students Collection

```
{
 "_id": ObjectId(),
 "first_name": "Srikanth",
 "last_name": "Thirumani",
 "dept_id": 1,
 "year_id": 1
}
```