1).Create a 3 tables named department, year and student.
Creating tables:-

Department-
-- Create the 'department' table
CREATE TABLE department (
    department_id INT PRIMARY KEY,
    department_name VARCHAR(50) NOT NULL
);

Year-
-- Create the 'year' table
CREATE TABLE year (
    year_id INT PRIMARY KEY,
    year_name VARCHAR(20) NOT NULL
);

Student-
-- Create the 'student' table
CREATE TABLE student (
    student_id INT PRIMARY KEY,
    student_name VARCHAR(100) NOT NULL,
    department_id INT,
    year_id INT,
    FOREIGN KEY (department_id) REFERENCES department(department_id),
    FOREIGN KEY (year_id) REFERENCES year(year_id)
);

Inserting values-
-- Insert example data into the 'department' table
INSERT INTO department (department_id, department_name) VALUES
(1, 'Computer Science'),
(2, 'Electrical Engineering'),
(3, 'Mechanical Engineering');

-- Insert example data into the 'year' table
INSERT INTO year (year_id, year_name) VALUES
(1, 'Freshman'),
(2, 'Sophomore'),
(3, 'Junior'),
(4, 'Senior');

-- Insert example data into the 'student' table
INSERT INTO student (student_id, student_name, department_id, year_id) VALUES
(1, 'John Doe', 1, 3), -- John Doe is a junior in Computer Science
(2, 'Jane Smith', 2, 2), -- Jane Smith is a sophomore in Electrical Engineering
(3, 'Alice Johnson', 3, 1); -- Alice Johnson is a freshman in Mechanical Engineering

_____

2).Student should contain relationship to both department and year.

CREATE TABLE student (
    student_id INT PRIMARY KEY,
    student_name VARCHAR(100) NOT NULL,
    department_id INT,
    year_id INT,
    FOREIGN KEY (department_id) REFERENCES department(department_id),
    FOREIGN KEY (year_id) REFERENCES year(year_id)

);

```
| student_id | student_name | department_id | year_id |
|------------|--------------|---------------|---------|
|     1      |   John doe   |      1        |    2    |
|     2      |  Jane Smith  |      2        |    3    |
|     3      | Alice jhonson|      1        |    4    |
```

_____

3).Table in mysql how can I create same in mongodb.

```
// Departments collection
{
  "_id": ObjectId("60aa0f"),
  "name": "Computer Science"
}

// Years collection
{
  "_id": ObjectId("60aa0f11"),
  "year": 2022
}

// Students collection
{
  "_id": ObjectId("60aa0f"),
  "name": "John Doe",
  "department_id": ObjectId("60aa0f35"),
  "year_id": ObjectId("60aa09f")
},
{
  "_id": ObjectId("60aa0f"),
  "name": "Jane Smith",
  "department_id": ObjectId("60aa0"),
  "year_id": ObjectId("60aa0f16")
},
{
  "_id": ObjectId("60a7ddcf"),
  "name": "Alice Johnson",
  "department_id": ObjectId("60aa0f1cf"),
  "year_id": ObjectId("60aadd1")
}
```

_____

4).Store Student for each department.

```
-- Insert 5 students for Computer Science department
INSERT INTO student (name, department_id, year_id)
SELECT 'John Doe', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Computer Science'
LIMIT 1;

INSERT INTO student (name, department_id, year_id)
SELECT 'Jane Smith', d.department_id, y.year_id
```

```sql
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Computer Science'
LIMIT 1;

INSERT INTO student (name, department_id, year_id)
SELECT 'Alex Johnson', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Computer Science'
LIMIT 1;

INSERT INTO student (name, department_id, year_id)
SELECT 'Emily Brown', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Computer Science'
LIMIT 1;

INSERT INTO student (name, department_id, year_id)
SELECT 'Michael Wilson', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Computer Science'
LIMIT 1;

-- Insert 5 students for Mathematics department
INSERT INTO student (name, department_id, year_id)
SELECT 'Alice Johnson', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Mathematics'
LIMIT 1;

INSERT INTO student (name, department_id, year_id)
SELECT 'Bob Williams', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Mathematics'
LIMIT 1;

INSERT INTO student (name, department_id, year_id)
SELECT 'Emma Davis', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Mathematics'
LIMIT 1;

INSERT INTO student (name, department_id, year_id)
SELECT 'James Miller', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Mathematics'
LIMIT 1;
```

```
INSERT INTO student (name, department_id, year_id)
SELECT 'Sophia Garcia', d.department_id, y.year_id
FROM department d
JOIN year y ON y.year = 2022
WHERE d.name = 'Mathematics'
LIMIT 1;
```

5).write a query to display students from cse department.

```
SELECT s.name, d.name AS department
FROM student s
JOIN department d ON s.department_id = d.department_id
WHERE d.name = 'Computer Science';
```

6).write a query to display only department using student table.

student_id	student_name	department
1	John	Biology
2	Sarah	Physics
3	Alice	Chemistry
4	Mike	Biology
5	Emily	Physics

```
SELECT DISTINCT department
FROM student;
```

department
Biology
Physics
Chemistry

7).write a query to display students sorted by department and first name.

student_id	student_name	department
1	John	Biology
2	Sarah	Physics
3	Alice	Chemistry
4	Mike	Biology
5	Emily	Physics

```
SELECT *
FROM student
ORDER BY department, student_name;
```

student_id	student_name	department
3	Alice	Chemistry
1	John	Biology
4	Mike	Biology
5	Emily	Physics

| 2 | Sarah | Physics |