Department Table

```
db.department.insertMany([
    { department_id: 1, department_name: 'Computer Science' },
    { department_id: 2, department_name: 'Electrical Engineering' },
    { department_id: 3, department_name: 'Mechanical Engineering' },
    { department_id: 4, department_name: 'Civil Engineering' }
]);
```

Year Table

```
db.year.insertMany([
    { year_id: 1, year_name: 'Freshman' },
    { year_id: 2, year_name: 'Sophomore' },
    { year_id: 3, year_name: 'Junior' },
    { year_id: 4, year_name: 'Senior' }
]);
```

Student Table

```
db.students.insertMany([
    // Computer Science Students
    { student_id: 1, first_name: 'John', last_name: 'Doe', department_id: 1, year_id: 1 },
    { student_id: 2, first_name: 'Jane', last_name: 'Smith', department_id: 1,
```

```
year_id: 2 },

    { student_id: 3, first_name: 'Alice', last_name: 'Johnson', department_id:
1, year_id: 3 },

    { student_id: 4, first_name: 'Bob', last_name: 'Brown', department_id: 1,
year_id: 4 },

    { student_id: 5, first_name: 'Charlie', last_name: 'Davis', department_id: 1,
year_id: 1 },


    // Electrical Engineering Students

    { student_id: 6, first_name: 'David', last_name: 'Miller', department_id: 2,
year_id: 1 },

    { student_id: 7, first_name: 'Eve', last_name: 'Wilson', department_id: 2,
year_id: 2 },

    { student_id: 8, first_name: 'Frank', last_name: 'Moore', department_id: 2,
year_id: 3 },

    { student_id: 9, first_name: 'Grace', last_name: 'Taylor', department_id: 2,
year_id: 4 },

    { student_id: 10, first_name: 'Hank', last_name: 'Anderson',
department_id: 2, year_id: 1 },


    // Mechanical Engineering Students

    { student_id: 11, first_name: 'Ivy', last_name: 'Thomas', department_id: 3,
year_id: 1 },

    { student_id: 12, first_name: 'Jack', last_name: 'Jackson', department_id:
3, year_id: 2 },

    { student_id: 13, first_name: 'Kelly', last_name: 'White', department_id: 3,
year_id: 3 },

    { student_id: 14, first_name: 'Leo', last_name: 'Harris', department_id: 3,
```

year_id: 4 },

{ student_id: 15, first_name: 'Mia', last_name: 'Martin', department_id: 3, year_id: 1 },

// Civil Engineering Students

{ student_id: 16, first_name: 'Noah', last_name: 'Garcia', department_id: 4, year_id: 1 },

{ student_id: 17, first_name: 'Olivia', last_name: 'Martinez', department_id: 4, year_id: 2 },

{ student_id: 18, first_name: 'Paul', last_name: 'Robinson', department_id: 4, year_id: 3 },

{ student_id: 19, first_name: 'Quincy', last_name: 'Clark', department_id: 4, year_id: 4 },

{ student_id: 20, first_name: 'Rachel', last_name: 'Rodriguez', department_id: 4, year_id: 1 }

]);

Query to Display Students from the Computer Science Department

```
db.students.aggregate([
  {
    $lookup: {
      from: "department",
      localField: "department_id",
      foreignField: "department_id",
      as: "department_info"
```

```
        }
    },
    {
        $unwind: "$department_info"
    },
    {
        $lookup: {
            from: "year",
            localField: "year_id",
            foreignField: "year_id",
            as: "year_info"
        }
    },
    {
        $unwind: "$year_info"
    },
    {
        $match: { "department_info.department_name": "Computer Science" }
    },
    {
        $project: {
            _id: 0,
            student_id: 1,
            first_name: 1,
```

```
            last_name: 1,

            department_name: "$department_info.department_name",

            year_name: "$year_info.year_name"

         }

      }

]);
```

```
db.students.aggregate([

   {

      $lookup: {

         from: "department",

         localField: "department_id",

         foreignField: "department_id",

         as: "department_info"

      }

   },

   {

      $unwind: "$department_info"

   },

   {

      $group: {

         _id: "$department_info.department_name"

      }
```

```
    },
    {
        $project: {
            _id: 0,
            department_name: "$_id"
        }
    }
]);
```

Query to Display Students Sorted by Department and First Name

```
db.students.aggregate([
    {
        $lookup: {
            from: "department",
            localField: "department_id",
            foreignField: "department_id",
            as: "department_info"
        }
    },
    {
        $unwind: "$department_info"
    },
    {
```

```
        $lookup: {

            from: "year",

            localField: "year_id",

            foreignField: "year_id",

            as: "year_info"

        }

    },

    {

        $unwind: "$year_info"

    },

    {

        $project: {

            _id: 0,

            student_id: 1,

            first_name: 1,

            last_name: 1,

            department_name: "$department_info.department_name",

            year_name: "$year_info.year_name"

        }

    },

    {

        $sort: { "department_name": 1, "first_name": 1 }

    }

]);
```