Assignment No. 10

Using same collection from assignment 9:
    mongo --host 10.10.10.55 --port 27017 te31145_db

db.students.insertMany([
  { name: "Song Joong-ki", department: "CSE", marks: 85, city: "Seoul" },
  { name: "Kim Seon-ho", department: "CSE", marks: 92, city: "Busan" },
  { name: "Ji Chang-wook", department: "IT", marks: 78, city: "Busan" },
  { name: "Lee Do-hyun", department: "IT", marks: 88, city: "Jeju" },
  { name: "Park Hyung-shik", department: "ECE", marks: 95, city: "Seoul" }
]);

Aggregate:

1. Average
    db.students.aggregate([{$group: {_id: "$department", avgmarks: {$avg: "$marks"}}}]);

```
{ "_id" : "IT", "avgmarks" : 83 }
{ "_id" : "CSE", "avgmarks" : 88.5 }
{ "_id" : "ECE", "avgmarks" : 95 }
```

2. Sum
    db.students.aggregate([{$group: {_id: "$city", totalstudents: {$sum: 1}}}]);

```
{ "_id" : "Seoul", "totalstudents" : 2 }
{ "_id" : "Busan", "totalstudents" : 2 }
{ "_id" : "Jeju", "totalstudents" : 1 }
```

3. Sort
    db.students.aggregate([{ $match: { marks: { $gt: 80 } } }, { $sort: { marks: -1 } }]).pretty();

```
{
        "_id" : ObjectId("68d4bf003b910ab8bafa78ca"),
        "name" : "Park Hyung-shik",
        "department" : "ECE",
        "marks" : 95,
        "city" : "Seoul"
}
{
        "_id" : ObjectId("68d4bf003b910ab8bafa78c7"),
        "name" : "Kim Seon-ho",
        "department" : "CSE",
        "marks" : 92,
        "city" : "Busan"
}
{
        "_id" : ObjectId("68d4bf003b910ab8bafa78c9"),
        "name" : "Lee Do-hyun",
        "department" : "IT",
        "marks" : 88,
        "city" : "Jeju"
}
{
        "_id" : ObjectId("68d4bf003b910ab8bafa78c6"),
        "name" : "Song Joong-ki",
        "department" : "CSE",
        "marks" : 85,
        "city" : "Seoul"
}
```

Indexing:

1. Single Field Index
   db.students.createIndex({ department: 1 });

```
{
    "numIndexesBefore" : 1,
    "numIndexesAfter" : 2,
    "createdCollectionAutomatically" : false,
    "ok" : 1
}
```

2. Compond Index
   db.students.createIndex({ department: 1, marks: -1 });

```
{
    "numIndexesBefore" : 2,
    "numIndexesAfter" : 3,
    "createdCollectionAutomatically" : false,
    "ok" : 1
}
```

3. Unique Index
   db.students.createIndex({ name: 1 }, { unique: true });

```
{
    "numIndexesBefore" : 3,
    "numIndexesAfter" : 4,
    "createdCollectionAutomatically" : false,
    "ok" : 1
}
```

4. Checking all Indexes
   db.students.getIndexes();

```
{
        "v" : 2,
        "key" : {
                "_id" : 1
        },
        "name" : "_id_"
},
{
        "v" : 2,
        "key" : {
                "department" : 1
        },
        "name" : "department_1"
},
{
        "v" : 2,
        "key" : {
                "department" : 1,
                "marks" : -1
        },
        "name" : "department_1_marks_-1"
},
{
        "v" : 2,
        "key" : {
                "name" : 1
        },
        "name" : "name_1",
        "unique" : true
}
]
```

5. Query with index

db.students.find({ department: "CSE" }).explain("executionStats");

```
{
        "_id" : ObjectId("68d4c15d70557c655609562b"),
        "name" : "Song Joong-ki",
        "department" : "CSE",
        "marks" : 85,
        "city" : "Seoul"
}
{
        "_id" : ObjectId("68d4c15d70557c655609562c"),
        "name" : "Kim Seon-ho",
        "department" : "CSE",
        "marks" : 92,
        "city" : "Busan"
}
```