

Assignment - B3

Design and Develop MongoDB Queries using aggregation and indexing with suitable example using MongoDB.

```
> use assignmentB3
switched to db assignmentB3
> db.createCollection('student')
{ "ok" : 1 }
> db.student.insert({roll:1,name:"navin",age:21,subject_marks:{OOP:70,DSA:80}})
WriteResult({ "nInserted" : 1 })
> db.student.insert([
  {roll:2,name:"saurabh",age:19,subject_marks:{OOP:90,DSA:85}},
  {roll:3,name:"aditya",age:20,subject_marks:{OOP:82,DSA:74}},
  {roll:4,name:"anusha",age:19,subject_marks:{OOP:70,DSA:65}},
  {roll:5,name:"anurag",age:20,subject_marks:{OOP:98,DSA:95}}])
BulkWriteResult({
  "writeErrors" : [ ],
  "writeConcernErrors" : [ ],
  "nInserted" : 4,
  "nUpserted" : 0,
  "nMatched" : 0,
  "nModified" : 0,
  "nRemoved" : 0,
  "upserted" : [ ]
})

> db.student.find().pretty()
{
  "_id" : ObjectId("6192264e5d9327cbe1b20458"),
  "roll" : 1,
  "name" : "navin",
  "age" : 21,
  "subject_marks" : {
    "OOP" : 70,
    "DSA" : 80
  }
}
{
  "_id" : ObjectId("619226795d9327cbe1b20459"),
  "roll" : 2,
  "name" : "saurabh",
  "age" : 19,
  "subject_marks" : {
    "OOP" : 90,
    "DSA" : 85
  }
}
```

```

{
  "_id" : ObjectId("619226795d9327cbe1b2045a"),
  "roll" : 3,
  "name" : "aditya",
  "age" : 20,
  "subject_marks" : {
    "OOP" : 82,
    "DSA" : 74
  }
}
{
  "_id" : ObjectId("619226795d9327cbe1b2045b"),
  "roll" : 4,
  "name" : "anusha",
  "age" : 19,
  "subject_marks" : {
    "OOP" : 70,
    "DSA" : 65
  }
}
{
  "_id" : ObjectId("619226795d9327cbe1b2045c"),
  "roll" : 5,
  "name" : "anurag",
  "age" : 20,
  "subject_marks" : {
    "OOP" : 98,
    "DSA" : 95
  }
}

```

//Unique Index

```

> db.student.createIndex({'roll':1},{unique:true})
{
  "createdCollectionAutomatically" : false,
  "numIndexesBefore" : 1,
  "numIndexesAfter" : 2,
  "ok" : 1
}

```

//Simple Index

```

> db.student.createIndex({"name":1})
{
  "createdCollectionAutomatically" : false,
  "numIndexesBefore" : 2,
  "numIndexesAfter" : 3,
  "ok" : 1
}

```

```

//Compound Index
> db.student.createIndex({"subject_marks.OOP":-
1,"subject_marks.DSA":-1})
{
  "createdCollectionAutomatically" : false,
  "numIndexesBefore" : 3,
  "numIndexesAfter" : 4,
  "ok" : 1
}
> db.student.getIndexes()
[
  {
    "v" : 2,
    "key" : {
      "_id" : 1
    },
    "name" : "_id_"
  },
  {
    "v" : 2,
    "unique" : true,
    "key" : {
      "roll" : 1
    },
    "name" : "roll_1"
  },
  {
    "v" : 2,
    "key" : {
      "name" : 1
    },
    "name" : "name_1"
  },
  {
    "v" : 2,
    "key" : {
      "subject_marks.OOP" : -1,
      "subject_marks.DSA" : -1
    },
    "name" : "subject_marks.OOP_-1_subject_marks.DSA_-1"
  }
]

> db.student.find().pretty().sort({name:1})
{
  "_id" : ObjectId("619226795d9327cbe1b2045a"),
  "roll" : 3,
  "name" : "aditya",

```

```

    "age" : 20,
    "subject_marks" : {
        "OOP" : 82,
        "DSA" : 74
    }
}
{
    "_id" : ObjectId("619226795d9327cbe1b2045c"),
    "roll" : 5,
    "name" : "anurag",
    "age" : 20,
    "subject_marks" : {
        "OOP" : 98,
        "DSA" : 95
    }
}
{
    "_id" : ObjectId("619226795d9327cbe1b2045b"),
    "roll" : 4,
    "name" : "anusha",
    "age" : 19,
    "subject_marks" : {
        "OOP" : 70,
        "DSA" : 65
    }
}
{
    "_id" : ObjectId("6192264e5d9327cbe1b20458"),
    "roll" : 1,
    "name" : "navin",
    "age" : 21,
    "subject_marks" : {
        "OOP" : 70,
        "DSA" : 80
    }
}
{
    "_id" : ObjectId("619226795d9327cbe1b20459"),
    "roll" : 2,
    "name" : "saurabh",
    "subject_marks" : {
        "OOP" : 90,
        "DSA" : 85
    },
    "age" : 19
}

```

```
> db.student.find().pretty().sort({"subject_marks.OOP":-
1,"subject_marks.DSA":-1})
{
  "_id" : ObjectId("619226795d9327cbe1b2045c"),
  "roll" : 5,
  "name" : "anurag",
  "age" : 20,
  "subject_marks" : {
    "OOP" : 98,
    "DSA" : 95
  }
}
{
  "_id" : ObjectId("619226795d9327cbe1b20459"),
  "roll" : 2,
  "name" : "saurabh",
  "subject_marks" : {
    "OOP" : 90,
    "DSA" : 85
  },
  "age" : 19
}
{
  "_id" : ObjectId("619226795d9327cbe1b2045a"),
  "roll" : 3,
  "name" : "aditya",
  "age" : 20,
  "subject_marks" : {
    "OOP" : 82,
    "DSA" : 74
  }
}
{
  "_id" : ObjectId("6192264e5d9327cbe1b20458"),
  "roll" : 1,
  "name" : "navin",
  "age" : 21,
  "subject_marks" : {
    "OOP" : 70,
    "DSA" : 80
  }
}
{
  "_id" : ObjectId("619226795d9327cbe1b2045b"),
  "roll" : 4,
  "name" : "anusha",
  "age" : 19,
  "subject_marks" : {
    "OOP" : 70,
```

```

        "DSA" : 65
    }
}

> db.student.distinct('age')
[ 19, 20, 21 ]

>
db.student.aggregate([{$group:{_id:"$age",count:{$sum:1}}},{ $sort:{
"_id":1}}])
{ "_id" : 19, "count" : 2 }
{ "_id" : 20, "count" : 2 }
{ "_id" : 21, "count" : 1 }

>
db.student.aggregate([{$group:{_id:"OOP",maxMarks:{$max:"$subject_m
arks.OOP"}}}])
{ "_id" : "OOP", "maxMarks" : 98 }

>
db.student.aggregate([{$group:{_id:"DSA",minMarks:{$min:"$subject_m
arks.DSA"}}}])
{ "_id" : "DSA", "minMarks" : 65 }

>
db.student.aggregate([{$project:{_id:"$roll",sum:{$sum:["$subject_m
arks.OOP","$subject_marks.DSA"]}}},{ $sort:{sum:1}}])
{ "_id" : 4, "sum" : 135 }
{ "_id" : 1, "sum" : 150 }
{ "_id" : 3, "sum" : 156 }
{ "_id" : 2, "sum" : 175 }
{ "_id" : 5, "sum" : 193 }

```