- **Database**

> db.createCollection('student');
{ "ok" : 1 }
>db.student.insert({"rollNo":1,"name":"Shubham","Dept":"CM","Add":"Pune","Marks":76,"ConNo":"9579522049"});
WriteResult({ "nInserted" : 1 })
> db.student.insert({"rollNo":2,"name":"Kartik","Dept":"IT","Add":"Mulshi","Marks":85});
WriteResult({ "nInserted" : 1 })
>db.student.insert({"rollNo":3,"name":"Rohan","Dept":"IT","Add":"Solapur","Marks":60,"Caste":"Open"});
WriteResult({ "nInserted" : 1 })
>db.student.insert({"rollNo":4,"name":"Pratik","Dept":"ME","Add":"Maval","Marks":45,"ConNo":"7744339890"});
WriteResult({ "nInserted" : 1 })
> db.student.insert({"rollNo":5,"name":"Kunal","Dept":"IT","Add":"Pune","M1":85,"M2":70});
WriteResult({ "nInserted" : 1 })
>
db.student.insert({"rollNo":6,"name":"Dnyanesh","Dept":"CE","Add":"Pune","M1":55,"M2":45});
WriteResult({ "nInserted" : 1 })
>
db.student.insert({"rollNo":7,"name":"Aditya","Dept":"AI","Add":"Kolhapur","M1":55,"M2":55});
WriteResult({ "nInserted" : 1 })

> db.student.find()
{ "_id" : ObjectId("6363dbeec837a39bf20a80c1"), "rollNo" : 1, "name" : "Shubham", "Dept" : "CM", "Add" : "Pune", "Marks" : 76, "ConNo" : "9579522049" }
{ "_id" : ObjectId("6363dc3dc837a39bf20a80c2"), "rollNo" : 2, "name" : "Kartik", "Dept" : "IT", "Add" : "Mulshi", "Marks" : 85 }
{ "_id" : ObjectId("6363dc90c837a39bf20a80c3"), "rollNo" : 3, "name" : "Rohan", "Dept" : "IT", "Add" : "Solapur", "Marks" : 60, "Caste" : "Open" }
{ "_id" : ObjectId("6363dcdac837a39bf20a80c4"), "rollNo" : 4, "name" : "Pratik", "Dept" : "ME", "Add" : "Maval", "Marks" : 45, "ConNo" : "7744339890" }
{ "_id" : ObjectId("6363df78c5831339b82853f5"), "rollNo" : 5, "name" : "Kunal", "Dept" : "IT", "Add" : "Pune", "M1" : 85, "M2" : 70 }
{ "_id" : ObjectId("6363dfaec5831339b82853f6"), "rollNo" : 6, "name" : "Dnyanesh", "Dept" : "CE", "Add" : "Pune", "M1" : 55, "M2" : 45 }
{ "_id" : ObjectId("6363e039c5831339b82853f7"), "rollNo" : 7, "name" : "Aditya", "Dept" : "AI", "Add" : "Kolhapur", "M1" : 55, "M2" : 55 }

- **$where Queries**

```
> db.student.find({"$where" : "function() { return this.M1 + this.M2 == 100; }"}).pretty()
{
     "_id" : ObjectId("6363dfaec5831339b82853f6"),
     "rollNo" : 6,
     "name" : "Dnyanesh",
     "Dept" : "CE",
     "Add" : "Pune",
     "M1" : 55,
     "M2" : 45
}
```

- **Cursor**

```
> var mycursor1 = db.student.find({"Dept":"IT"}).pretty()
> mycursor1
{
    "_id" : ObjectId("6363e5c2111a54acd7bd335c"),
    "rollNo" : 2,
    "name" : "Kartik",
    "Dept" : "IT",
    "Add" : "Mulshi",
    "Marks" : 85
}
{
    "_id" : ObjectId("6363e5d6111a54acd7bd335d"),
    "rollNo" : 3,
    "name" : "Rohan",
    "Dept" : "IT",
    "Add" : "Solapur",
    "Marks" : 60,
    "Caste" : "Open"
}
{
    "_id" : ObjectId("6363e5e9111a54acd7bd335f"),
    "rollNo" : 5,
    "name" : "Kunal",
    "Dept" : "IT",
    "Add" : "Pune",
    "M1" : 85,
    "M2" : 70
}
{
    "_id" : ObjectId("6363df78c5831339b82853f5"),
    "rollNo" : 5,
    "name" : "Kunal",
    "Dept" : "IT",
    "Add" : "Pune",
    "M1" : 85,
    "M2" : 70
}
```

- **Limit, Skips, Sorts**

> db.student.find().limit(3);
{ "_id" : ObjectId("6363e598111a54acd7bd335b"), "rollNo" : 1, "name" : "Shubham", "Dept" : "CM", "Add" : "Pune", "Marks" : 76, "ConNo" : "9579522049" }
{ "_id" : ObjectId("6363e5c2111a54acd7bd335c"), "rollNo" : 2, "name" : "Kartik", "Dept" : "IT", "Add" : "Mulshi", "Marks" : 85 }
{ "_id" : ObjectId("6363e5d6111a54acd7bd335d"), "rollNo" : 3, "name" : "Rohan", "Dept" : "IT", "Add" : "Solapur", "Marks" : 60, "Caste" : "Open" }

> db.student.find().skip(3);
{ "_id" : ObjectId("6363e5df111a54acd7bd335e"), "rollNo" : 4, "name" : "Pratik", "Dept" : "ME", "Add" : "Maval", "Marks" : 45, "ConNo" : "7744339890" }
{ "_id" : ObjectId("6363e5e9111a54acd7bd335f"), "rollNo" : 5, "name" : "Kunal", "Dept" : "IT", "Add" : "Pune", "M1" : 85, "M2" : 70 }
{ "_id" : ObjectId("6363e5f2111a54acd7bd3360"), "rollNo" : 6, "name" : "Dnyanesh", "Dept" : "CE", "Add" : "Pune", "M1" : 55, "M2" : 45 }
{ "_id" : ObjectId("6363e5fc111a54acd7bd3361"), "rollNo" : 7, "name" : "Aditya", "Dept" : "AI", "Add" : "Kolhapur", "M1" : 55, "M2" : 55 }

> db.student.find().sort({"rollNo":-1});
{ "_id" : ObjectId("6363e5fc111a54acd7bd3361"), "rollNo" : 7, "name" : "Aditya", "Dept" : "AI", "Add" : "Kolhapur", "M1" : 55, "M2" : 55 }
{ "_id" : ObjectId("6363e5f2111a54acd7bd3360"), "rollNo" : 6, "name" : "Dnyanesh", "Dept" : "CE", "Add" : "Pune", "M1" : 55, "M2" : 45 }
{ "_id" : ObjectId("6363e5e9111a54acd7bd335f"), "rollNo" : 5, "name" : "Kunal", "Dept" : "IT", "Add" : "Pune", "M1" : 85, "M2" : 70 }
{ "_id" : ObjectId("6363e5df111a54acd7bd335e"), "rollNo" : 4, "name" : "Pratik", "Dept" : "ME", "Add" : "Maval", "Marks" : 45, "ConNo" : "7744339890" }
{ "_id" : ObjectId("6363e5d6111a54acd7bd335d"), "rollNo" : 3, "name" : "Rohan", "Dept" : "IT", "Add" : "Solapur", "Marks" : 60, "Caste" : "Open" }
{ "_id" : ObjectId("6363e5c2111a54acd7bd335c"), "rollNo" : 2, "name" : "Kartik", "Dept" : "IT", "Add" : "Mulshi", "Marks" : 85 }
{ "_id" : ObjectId("6363e598111a54acd7bd335b"), "rollNo" : 1, "name" : "Shubham", "Dept" : "CM", "Add" : "Pune", "Marks" : 76, "ConNo" : "9579522049" }

Database:

> db.createCollection('stud');
{ "ok" : 1 }
> db.stud.insert({"id":1, "sec":"A", "marks":80});
WriteResult({ "nInserted" : 1 })
> db.stud.insert({"id":2, "sec":"A", "marks":90});
WriteResult({ "nInserted" : 1 })
> db.stud.insert({"id":3, "sec":"B", "marks":99});
WriteResult({ "nInserted" : 1 })
> db.stud.insert({"id":1, "sec":"B", "marks":95});
WriteResult({ "nInserted" : 1 })
> db.stud.insert({"id":1, "sec":"C", "marks":90});
WriteResult({ "nInserted" : 1 })
> db.stud.find();
{ "_id" : ObjectId("6363f63be94c42f195d1cdff"), "id" : 1, "sec" : "A", "marks" : 80 }
{ "_id" : ObjectId("6363f64ce94c42f195d1ce00"), "id" : 2, "sec" : "A", "marks" : 90 }
{ "_id" : ObjectId("6363f668e94c42f195d1ce01"), "id" : 3, "sec" : "B", "marks" : 99 }
{ "_id" : ObjectId("6363f67fe94c42f195d1ce02"), "id" : 1, "sec" : "B", "marks" : 95 }
{ "_id" : ObjectId("6363f690e94c42f195d1ce03"), "id" : 1, "sec" : "C", "marks" : 90 }

- **Map-reduce**

> var map=function(){ emit(this.sec,this.marks)};

> var reduce=function(sec,marks){ return Array.sum(marks);};

> db.stud.mapReduce(map,reduce,{out :"resultCollection2"});

{ "result" : "resultCollection2", "ok" : 1 }

> db.resultCollection2.find()
{ "_id" : "B", "value" : 194 }
{ "_id" : "A", "value" : 170 }
{ "_id" : "C", "value" : 90 }

- **Indexing**

> db.stud.createIndex({marks:1})

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

> db.stud.getIndexes()

```
[
     {
          "v" : 2,
          "key" : {
               "_id" : 1
          },
          "name" : "_id_"
     },
     {
          "v" : 2,
          "key" : {
               "marks" : 1
          },
          "name" : "marks_1"
     }
]
```

- **Aggregation**

> db.stud.aggregate([{$group : {_id: "$sec", TotalRecords: {$sum : 1}}}])

{ "_id" : "C", "TotalRecords" : 1 }

{ "_id" : "A", "TotalRecords" : 2 }

{ "_id" : "B", "TotalRecords" : 2 }

```
> db.createCollection("teacher")
{ "ok" : 1 }
> db.teacher.insert({t_id:1, name:"Kamlesh Amin",dept:"Comp",sal:15000,status:"A"})
WriteResult({ "nInserted" : 1 })
> db.teacher.insert({t_id:2, name:"Rajesh",dept:"IT",sal:25000,status:"A"})
WriteResult({ "nInserted" : 1 })
> db.teacher.insert({t_id:3, name:"Ravi",dept:"IT",sal:20000,status:"A"})
WriteResult({ "nInserted" : 1 })
> db.teacher.insert({t_id:4, name:"Kavitai",dept:"IT",sal:120000,status:"N"})
WriteResult({ "nInserted" : 1 })
> db.teacher.insert({t_id:5, name:"Kavya",dept:"Comp",sal:40000,status:"A"})
WriteResult({ "nInserted" : 1 })
> db.teacher.insert({t_id:5, name:"Ronit",dept:"Comp",sal:45000,status:"N"})
WriteResult({ "nInserted" : 1 })
>


> db.teacher.find()
{ "_id" : ObjectId("544144c5534f731837e302ee"), "t_id" : 1, "name" : "Kamlesh Amin", "dept
" : "Comp", "sal" : 15000, "status" : "A" }
{ "_id" : ObjectId("54414585534f731837e302ef"), "t_id" : 2, "name" : "Rajesh", "dept" : "I
T", "sal" : 25000, "status" : "A" }
{ "_id" : ObjectId("544145c0534f731837e302f2"), "t_id" : 3, "name" : "Ravi", "dept" : "IT"
, "sal" : 20000, "status" : "A" }
{ "_id" : ObjectId("544145c6534f731837e302f3"), "t_id" : 4, "name" : "Kavitai", "dept" : "
IT", "sal" : 120000, "status" : "N" }
{ "_id" : ObjectId("54414666534f731837e302f4"), "t_id" : 5, "name" : "Kavya", "dept" : "Co
mp", "sal" : 40000, "status" : "A" }
{ "_id" : ObjectId("54414675534f731837e302f5"), "t_id" : 6, "name" : "Ronit", "dept" : "Co
mp", "sal" : 45000, "status" : "N" }
```

- **Indexing**

```
> db.teacher.ensureIndex({t_id:2});
{
    "createdCollectionAutomatically" : false,
    "numIndexesBefore" : 1,
    "numIndexesAfter" : 2,
    "ok" : 1
}
```

- **Aggrigation**

```
> db.teacher.aggregate({$group:{_id:"$status",sum:{$sum:"$sal"}}})
{ "_id" : "N", "sum" : 165000 }
{ "_id" : "A", "sum" : 100000 }


>
db.teacher.aggregate({$group:{_id:"$status",sum:{$sum:"$sal"}}},{$match:{sum:{$gte:150000
}}})
{ "_id" : "N", "sum" : 165000 }
```

Map-reduce:

```
> use king
switched to db king
> db.createCollection("pop");
{ "ok" : 1 }
> db.pop.insert({city:"pune",population:200000});
WriteResult({ "nInserted" : 1 })
> db.pop.insert({city:"mumbai",population:800000});
WriteResult({ "nInserted" : 1 })
> db.pop.insert({city:"udaipur",population:90000});
WriteResult({ "nInserted" : 1 })
> db.pop.insert({city:"nagpur",population:100000});
WriteResult({ "nInserted" : 1 })
> db.pop.insert({city:"jaipur",population:900000});
WriteResult({ "nInserted" : 1 })
> db.pop.find();
{ "_id" : ObjectId("59dae80647d0a1fc6be713cc"), "city" : "pune", "population" : 200000 }
{ "_id" : ObjectId("59dae80f47d0a1fc6be713cd"), "city" : "mumbai", "population" : 800000 }
{ "_id" : ObjectId("59dae81847d0a1fc6be713ce"), "city" : "udaipur", "population" : 90000 }
{ "_id" : ObjectId("59dae84647d0a1fc6be713cf"), "city" : "nagpur", "population" : 100000 }
{ "_id" : ObjectId("59dae85547d0a1fc6be713d0"), "city" : "jaipur", "population" : 900000 }
```

> var mapfunc=function() {emit(null,this.population);};

> var reducefunc=function(country,population) {return Array.sum(population);};

> db.pop.mapReduce(mapfunc,reducefunc,{out:"total"});

```
{
        "result" : "total",
        "timeMillis" : 457,
        "counts" : {
                "input" : 5,
                "emit" : 5,
```

```
                "reduce" : 1,
                "output" : 1
        },
        "ok" : 1
}
> db.total.find();
{ "_id" : null, "value" : 2090000 }
>
```