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Class : TE A

Roll No : TECOA124

Batch : A2

Assignment No. 10

Title: Aggregation in MongoDB

1. Consider each document in the zipcode collection has the following form:

{

"_id": "10280",

"city": "NEW YORK",

"state": "NY",

"pop": 5574,

}

Return States with Populations above 10 Million

db.zipcode.find({})

{ "_id" : ObjectId("5d71e0700787a916d594dbd0"), "city" : "pune", "state" : "mah", "pop" : 50000 }

{ "_id" : ObjectId("5d71e0b90787a916d594dbd1"), "city" : "mumbai", "state" : "mah", "pop" : 100000 }

{ "_id" : ObjectId("5d71e14d0787a916d594dbd2"), "city" : "nashik", "state" : "mah", "pop" : 50000 }

{ "_id" : ObjectId("5d71e15f0787a916d594dbd3"), "city" : "aurangabad", "state" : "mah", "pop" : 20000 }

{ "_id" : ObjectId("5d71e18c0787a916d594dbd4"), "city" : "varanasi", "state" : "up", "pop" : 40000 }

{ "_id" : ObjectId("5d71e1d60787a916d594dbd5"), "city" : "lucknow", "state" : "up", "pop" : 70000 }

{ "_id" : ObjectId("5d71e38c0787a916d594dbd6"), "city" : "gorakhpur", "state" : "up", "pop" : 10000000 }

{ "_id" : ObjectId("5d71e74e0787a916d594dbd7"), "city" : "rampur", "state" : "up", "pop" : 20000000 }

db.zipcode.aggregate({$group:{_id:'$state',totpop:{$sum:'$pop'}}},{$match: {totpop:{$gte:10000000}}})

{ "result" : [{ "_id" : "up", "totpop" : 30110000 }], "ok" : 1 }

2. Display the department wise average salary

db.emp.find()

{ "_id" : ObjectId("5d71d8d30787a916d594dbc8"), "name" : "mayur", "dept" : "comp", "sal" : 50000 }

{ "_id" : ObjectId("5d71d90f0787a916d594dbc9"), "name" : "abc", "dept" : "me", "sal" : 2000 }

{ "_id" : ObjectId("5d71d9780787a916d594dbca"), "name" : "rahul", "dept" : "comp", "sal" : 100000 }

{ "_id" : ObjectId("5d71d9c40787a916d594dbcb"), "name" : "ashwin", "dept" : "it", "sal" : 20000 }

{ "_id" : ObjectId("5d71da180787a916d594dbcc"), "name" : "saikh", "dept" : "me", "sal" : 50000 }

{ "_id" : ObjectId("5d71da4d0787a916d594dbcd"), "name" : "vaishnavi", "dept" : "ce", "sal" : 5000 }

{ "_id" : ObjectId("5d71da600787a916d594dbce"), "name" : "swapnil", "dept" : "ce", "sal" : 30000 }

{ "_id" : ObjectId("5d71da760787a916d594dbcf"), "name" : "bhavesh", "dept" : "it", "sal" : 40000 }

db.emp.aggregate({$group:{_id:'$dept',avgsal:{$avg:'$sal'}}})

{

      "result" : [

            {

                  "_id" : "ce",

                  "avgsal" : 17500

            },

            {

                  "_id" : "it",

                  "avgsal" : 30000

            },

            {

                  "_id" : "me",

                  "avgsal" : 26000

```
                },

                {

                        "_id" : "comp",

                        "avgsal" : 75000

                }

        ],

        "ok" : 1

}
```

3. display the no. Of employees working in each department

db.emp.find()

{ "_id" : ObjectId("5d71d8d30787a916d594dbc8"), "name" : "mayur", "dept" : "comp", "sal" : 50000 }

{ "_id" : ObjectId("5d71d90f0787a916d594dbc9"), "name" : "abc", "dept" : "me", "sal" : 2000 }

{ "_id" : ObjectId("5d71d9780787a916d594dbca"), "name" : "rahul", "dept" : "comp", "sal" : 100000 }

{ "_id" : ObjectId("5d71d9c40787a916d594dbcb"), "name" : "ashwin", "dept" : "it", "sal" : 20000 }

{ "_id" : ObjectId("5d71da180787a916d594dbcc"), "name" : "saikh", "dept" : "me", "sal" : 50000 }

{ "_id" : ObjectId("5d71da4d0787a916d594dbcd"), "name" : "vaishnavi", "dept" : "ce", "sal" : 5000 }

{ "_id" : ObjectId("5d71da600787a916d594dbce"), "name" : "swapnil", "dept" : "ce", "sal" : 30000 }

{ "_id" : ObjectId("5d71da760787a916d594dbcf"), "name" : "bhavesh", "dept" : "it", "sal" : 40000 }

> db.emp.aggregate({$group:{_id:'$dept',empcnt:{$sum:1}}})

```
{

        "result" : [

                {

                        "_id" : "ce",

                        "empcnt" : 2

                },

                {
```

```
                    "_id" : "it",

                    "empcnt" : 2

            },

            {

                    "_id" : "me",

                    "empcnt" : 2

            },

            {

                    "_id" : "comp",

                    "empcnt" : 2

            }

    ],

    "ok" : 1

}
```

4. Display the department wise total salary of departments having total salary greater than or equals to

50000/-

db.emp.find()

{ "_id" : ObjectId("5d71d8d30787a916d594dbc8"), "name" : "mayur", "dept" : "comp", "sal" : 50000 }

{ "_id" : ObjectId("5d71d90f0787a916d594dbc9"), "name" : "abc", "dept" : "me", "sal" : 2000 }

{ "_id" : ObjectId("5d71d9780787a916d594dbca"), "name" : "rahul", "dept" : "comp", "sal" : 100000 }

{ "_id" : ObjectId("5d71d9c40787a916d594dbcb"), "name" : "ashwin", "dept" : "it", "sal" : 20000 }

{ "_id" : ObjectId("5d71da180787a916d594dbcc"), "name" : "saikh", "dept" : "me", "sal" : 50000 }

{ "_id" : ObjectId("5d71da4d0787a916d594dbcd"), "name" : "vaishnavi", "dept" : "ce", "sal" : 5000 }

{ "_id" : ObjectId("5d71da600787a916d594dbce"), "name" : "swapnil", "dept" : "ce", "sal" : 30000 }

{ "_id" : ObjectId("5d71da760787a916d594dbcf"), "name" : "bhavesh", "dept" : "it", "sal" : 40000 }

> db.emp.aggregate({$group:{_id:'$dept',avgsal:{$avg:'$sal'}}},{$match: {avgsal:{$gt:50000}}})

{ "result" : [{ "_id" : "comp", "avgsal" : 75000 }], "ok" : 1 }

5. Write the queries using the different operators like max, min. Etc.

> db.teachers.find()

{ "_id" : ObjectId("5d68a54e929b042788bd46c1"), "tname" : "rahul", "dno" : 101, "dname" : "comp", "experience" : 5, "salary" : 50000, "doj" : ISODate("1998-12-31T18:30:00Z") }

{ "_id" : ObjectId("5d68a62d929b042788bd46c2"), "dname" : "comp", "dno" : 101, "doj" : ISODate("2005-05-31T18:30:00Z"), "experience" : 3, "salary" : 20000, "tname" : "sonali" }

{ "_id" : ObjectId("5d68a696929b042788bd46c3"), "tname" : "sudeep", "dno" : 101, "dname" : "comp", "experience" : 15, "salary" : 200000, "doj" : ISODate("1997-05-31T18:30:00Z") }

{ "_id" : ObjectId("5d68a724929b042788bd46c4"), "tname" : "ashley", "dno" : 101, "dname" : "comp", "experience" : 1, "salary" : 2000, "doj" : ISODate("2018-05-31T18:30:00Z") }

{ "_id" : ObjectId("5d68a928929b042788bd46c5"), "tname" : "reema", "dno" : 103, "dname" : "entc", "experience" : 4, "salary" : 30000, "doj" : ISODate("2012-12-11T18:30:00Z") }

{ "_id" : ObjectId("5d68a994929b042788bd46c6"), "tname" : "sayali", "dno" : 103, "dname" : "entc", "experience" : 2, "salary" : 10000, "doj" : ISODate("2017-08-22T18:30:00Z") }

{ "_id" : ObjectId("5d68aac2929b042788bd46c7"), "tname" : "shaikh", "dno" : 104, "dname" : "mech", "experience" : 7, "salary" : 100000, "doj" : ISODate("2000-07-28T18:30:00Z") }

{ "_id" : ObjectId("5d68aaf8929b042788bd46c8"), "tname" : "jagtap", "dno" : 105, "dname" : "ce", "experience" : 6, "salary" : 70000, "doj" : ISODate("2002-07-19T18:30:00Z") }

{ "_id" : ObjectId("5d70ae9da11857cf2efb5c3e"), "dname" : "comp", "dno" : 101, "doj" : ISODate("1998-12-22T18:30:00Z"), "experience" : 4, "salary" : 40000, "tname" : "kulloli" }

{ "_id" : ObjectId("5d70aec5a11857cf2efb5c3f"), "dname" : "comp", "dno" : 101, "doj" : ISODate("1999-03-18T18:30:00Z"), "experience" : 1, "salary" : 400, "tname" : "gokhale" }

> db.teachers.aggregarte([{$group:{_id:{},maxexp:{$max:"$experience"}}}])

Fri Sep 27 10:44:17.638 TypeError: Property 'aggregarte' of object pccoe124.teachers is not a function

> db.teachers.aggregate([{$group:{_id:{},maxexp:{$max:"$experience"}}}])

{

        "result" : [

                {

```
                    "_id" : {


                    },
                    "maxexp" : 15

            }
        ],
        "ok" : 1
}
db.teachers.aggregate([{$group:{_id:{},minsal:{$min:"$salary"}}}])
{
        "result" : [
                {
                        "_id" : {


                        },
                        "minsal" : 400

                }
        ],
        "ok" : 1
}
```

6. Create the simple index on roll_no field

> db.student.find()

{ "_id" : ObjectId("5d70a4cd3a696c644c18b6ec"), "name" : "ashwin", "roll" : 1 }

{ "_id" : ObjectId("5d70a5873a696c644c18b6ed"), "name" : "abc", "roll" : 2 }

{ "_id" : ObjectId("5d70a5cb3a696c644c18b6ee"), "name" : "mayur", "roll" : 3 }

{ "_id" : ObjectId("5d70a7e73a696c644c18b6ef"), "name" : "xyz", "roll" : 5 }

{ "_id" : ObjectId("5d70a9ef3a696c644c18b6f0"), "name" : "bhavesh", "roll" : 7 }

{ "_id" : ObjectId("5d70aa333a696c644c18b6f1"), "name" : "xyz", "roll" : 10 }

> db.student.ensureIndex({roll:1})

> db.student.getIndexes()

[

```
        {
                "v" : 1,
                "key" : {
                        "_id" : 1
                },
                "ns" : "pccoe124.student",
                "name" : "_id_"
        },
        {
                "v" : 1,
                "key" : {
                        "roll" : 1
                },
                "ns" : "pccoe124.student",
                "name" : "roll_1"
        }
]
```

7. create unique index on any field for above given collections

> db.student.find()

{ "_id" : ObjectId("5d70a4cd3a696c644c18b6ec"), "name" : "ashwin", "roll" : 1 }

{ "_id" : ObjectId("5d70a5873a696c644c18b6ed"), "name" : "abc", "roll" : 2 }

{ "_id" : ObjectId("5d70a5cb3a696c644c18b6ee"), "name" : "mayur", "roll" : 3 }

{ "_id" : ObjectId("5d70a7e73a696c644c18b6ef"), "name" : "xyz", "roll" : 5 }

{ "_id" : ObjectId("5d70a9ef3a696c644c18b6f0"), "name" : "bhavesh", "roll" : 7 }

{ "_id" : ObjectId("5d70aa333a696c644c18b6f1"), "name" : "xyz", "roll" : 10 }

> db.student.createIndex({roll:1},{unique:true})

> db.student.getIndexes()

```
[
        {
                "v" : 1,
                "key" : {
```

```
                    "_id" : 1
            },

            "ns" : "pccoe124.student",

            "name" : "_id_"

        },

        {

            "v" : 1,

            "key" : {

                    "roll" : 1

            },

            "ns" : "pccoe124.student",

            "name" : "roll_1"

        }

]
```

8. create compound index on any fields for above given collections

> db.teachers.find()

{ "_id" : ObjectId("5d68a54e929b042788bd46c1"), "tname" : "rahul", "dno" : 101, "dname" : "comp", "experience" : 5, "salary" : 50000, "doj" : ISODate("1998-12-31T18:30:00Z") }

{ "_id" : ObjectId("5d68a62d929b042788bd46c2"), "dname" : "comp", "dno" : 101, "doj" : ISODate("2005-05-31T18:30:00Z"), "experience" : 3, "salary" : 20000, "tname" : "sonali" }

{ "_id" : ObjectId("5d68a696929b042788bd46c3"), "tname" : "sudeep", "dno" : 101, "dname" : "comp", "experience" : 15, "salary" : 200000, "doj" : ISODate("1997-05-31T18:30:00Z") }

{ "_id" : ObjectId("5d68a724929b042788bd46c4"), "tname" : "ashley", "dno" : 101, "dname" : "comp", "experience" : 1, "salary" : 2000, "doj" : ISODate("2018-05-31T18:30:00Z") }

{ "_id" : ObjectId("5d68a928929b042788bd46c5"), "tname" : "reema", "dno" : 103, "dname" : "entc", "experience" : 4, "salary" : 30000, "doj" : ISODate("2012-12-11T18:30:00Z") }

{ "_id" : ObjectId("5d68a994929b042788bd46c6"), "tname" : "sayali", "dno" : 103, "dname" : "entc", "experience" : 2, "salary" : 10000, "doj" : ISODate("2017-08-22T18:30:00Z") }

{ "_id" : ObjectId("5d68aac2929b042788bd46c7"), "tname" : "shaikh", "dno" : 104, "dname" : "mech", "experience" : 7, "salary" : 100000, "doj" : ISODate("2000-07-28T18:30:00Z") }

{ "_id" : ObjectId("5d68aaf8929b042788bd46c8"), "tname" : "jagtap", "dno" : 105, "dname" : "ce", "experience" : 6, "salary" : 70000, "doj" : ISODate("2002-07-19T18:30:00Z") }

{ "_id" : ObjectId("5d70ae9da11857cf2efb5c3e"), "dname" : "comp", "dno" : 101, "doj" : ISODate("1998-12-22T18:30:00Z"), "experience" : 4, "salary" : 40000, "tname" : "kulloli" }

{ "_id" : ObjectId("5d70aec5a11857cf2efb5c3f"), "dname" : "comp", "dno" : 101, "doj" : ISODate("1999-03-18T18:30:00Z"), "experience" : 1, "salary" : 400, "tname" : "gokhale" }

> db.teachers.createIndex({tname:1,dno:1,experience:1,salary:1},{unique:true})

> db.teachers.getIndexes()

```
[
        {
                "v" : 1,
                "key" : {
                        "_id" : 1
                },
                "ns" : "pccoe124.teachers",
                "name" : "_id_"
        },
        {
                "v" : 1,
                "key" : {
                        "tname" : 1
                },
                "ns" : "pccoe124.teachers",
                "name" : "tname_1"
        },
        {
                "v" : 1,
                "key" : {
                        "tname" : 1,
                        "dno" : 1,
                        "experience" : 1,
```

```
                    "salary" : 1

            },

            "unique" : true,

            "ns" : "pccoe124.teachers",

            "name" : "tname_1_dno_1_experience_1_salary_1"

        }

]
```

9. Show all the indexes created in the database PCCOE

db.system.indexes.find()

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.teachers", "name" : "_id_" }

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.student", "name" : "_id_" }

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.pccoe124.teachers", "name" : "_id_" }

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.pccoe124", "name" : "_id_" }

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.department", "name" : "_id_" }

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.emp", "name" : "_id_" }

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.zipcodes", "name" : "_id_" }

{ "v" : 1, "key" : { "_id" : 1 }, "ns" : "pccoe124.zipcode", "name" : "_id_" }

{ "v" : 1, "key" : { "tname" : 1 }, "ns" : "pccoe124.teachers", "name" : "tname_1" }

{ "v" : 1, "key" : { "roll" : 1 }, "ns" : "pccoe124.student", "name" : "roll_1" }

{ "v" : 1, "key" : { "tname" : 1, "dno" : 1, "experience" : 1, "salary" : 1 }, "unique" : true, "ns" : "pccoe124.teachers", "name" : "tname_1_dno_1_experience_1_salary_1" }

10. Show all the indexes created in above collections

> db.emp.getIndexes()

```
[

        {

                "v" : 1,

                "key" : {

                        "_id" : 1

                },

                "ns" : "pccoe124.emp",

                "name" : "_id_"
```

```
        }
]
> db.zipcode.getIndexes()
[
        {
                "v" : 1,
                "key" : {
                        "_id" : 1
                },
                "ns" : "pccoe124.zipcode",
                "name" : "_id_"
        }
]
> db.teachers.getIndexes()
[
        {
                "v" : 1,
                "key" : {
                        "_id" : 1
                },
                "ns" : "pccoe124.teachers",
                "name" : "_id_"
        },
        {
                "v" : 1,
                "key" : {
                        "tname" : 1
                },
                "ns" : "pccoe124.teachers",
                "name" : "tname_1"
        },
```

```
        {
                "v" : 1,
                "key" : {
                        "tname" : 1,
                        "dno" : 1,
                        "experience" : 1,
                        "salary" : 1
                },
                "unique" : true,
                "ns" : "pccoe124.teachers",
                "name" : "tname_1_dno_1_experience_1_salary_1"
        }
]
```