**2. MongoDB – Aggregation and Indexing:**

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

> db.createCollection("records");

{ "ok" : 1 }

> db.records.insert({rollno:1,name:"sayali",subj:"TOC",marks:78});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:2,name:"pooja",subj:"TOC",marks:65});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:3,name:"prachi",subj:"TOC",marks:80});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:4,name:"pallavi",subj:"TOC",marks:70});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:5,name:"amruta",subj:"db",marks:67});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:6,name:"priti",subj:"ISEE",marks:97});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:7,name:"diksha",subj:"oop",marks:59});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:8,name:"deepika",subj:"cn",marks:70});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:9,name:"genelia",subj:"sepm",marks:84});

WriteResult({ "nInserted" : 1 })

> db.records.insert({rollno:10,name:"amaraya",subj:"sepm",marks:77});

WriteResult({ "nInserted" : 1 })

> db.records.aggregate([{$group:{\_id:"$subj",marks:{$min:"$marks"}}}]);

{ "\_id" : "sepm", "marks" : 77 }

{ "\_id" : "cn", "marks" : 70 }

{ "\_id" : "oop", "marks" : 59 }

{ "\_id" : "ISEE", "marks" : 97 }

{ "\_id" : "db", "marks" : 67 }

{ "\_id" : "TOC", "marks" : 65 }

> db.records.aggregate([{$group:{\_id:"$subj",marks:{$max:"$marks"}}}]);

{ "\_id" : "sepm", "marks" : 84 }

{ "\_id" : "cn", "marks" : 70 }

{ "\_id" : "oop", "marks" : 59 }

{ "\_id" : "ISEE", "marks" : 97 }

{ "\_id" : "db", "marks" : 67 }

{ "\_id" : "TOC", "marks" : 80 }

> db.records.aggregate([{$group:{\_id:"$subj",marks:{$sum:"$marks"}}}]);

{ "\_id" : "sepm", "marks" : 161 }

{ "\_id" : "cn", "marks" : 70 }

{ "\_id" : "oop", "marks" : 59 }

{ "\_id" : "ISEE", "marks" : 97 }

{ "\_id" : "db", "marks" : 67 }

{ "\_id" : "TOC", "marks" : 293 }

> db.records.aggregate([{$group:{\_id:"$subj",marks:{$avg:"$marks"}}}]);

{ "\_id" : "sepm", "marks" : 80.5 }

{ "\_id" : "cn", "marks" : 70 }

{ "\_id" : "oop", "marks" : 59 }

{ "\_id" : "ISEE", "marks" : 97 }

{ "\_id" : "db", "marks" : 67 }

{ "\_id" : "TOC", "marks" : 73.25 }

> db.records.aggregate([{$group:{\_id:"$subj",marks:{$last:"$marks"}}}]);

{ "\_id" : "sepm", "marks" : 77 }

{ "\_id" : "cn", "marks" : 70 }

{ "\_id" : "oop", "marks" : 59 }

{ "\_id" : "ISEE", "marks" : 97 }

{ "\_id" : "db", "marks" : 67 }

{ "\_id" : "TOC", "marks" : 70 }

> db.records.aggregate([{$group:{\_id:"$subj",marks:{$first:"$marks"}}}]);

{ "\_id" : "sepm", "marks" : 84 }

{ "\_id" : "cn", "marks" : 70 }

{ "\_id" : "oop", "marks" : 59 }

{ "\_id" : "ISEE", "marks" : 97 }

{ "\_id" : "db", "marks" : 67 }

{ "\_id" : "TOC", "marks" : 78 }

> db.records.ensureIndex({rollno:1});

{

"createdCollectionAutomatically" : false,

"numIndexesBefore" : 1,

"numIndexesAfter" : 2,

"ok" : 1

}

> db.records.getIndexes();

[

{

"v" : 1,

"key" : {

"\_id" : 1

},

"name" : "\_id\_",

"ns" : "pravara.records"

},

{

"v" : 1,

"key" : {

"rollno" : 1

},

"name" : "rollno\_1",

"ns" : "pravara.records"

}

]

> db.records.find().min({rollno:4});

{ "\_id" : ObjectId("61a1b21aeb4f6cb4db6d94cd"), "rollno" : 4, "name" : "pall

, "subj" : "TOC", "marks" : 70 }

{ "\_id" : ObjectId("61a1b224eb4f6cb4db6d94ce"), "rollno" : 5, "name" : "amru

"subj" : "db", "marks" : 67 }

{ "\_id" : ObjectId("61a1b22ceb4f6cb4db6d94cf"), "rollno" : 6, "name" : "prit

"subj" : "ISEE", "marks" : 97 }

{ "\_id" : ObjectId("61a1b232eb4f6cb4db6d94d0"), "rollno" : 7, "name" : "diks

"subj" : "oop", "marks" : 59 }

{ "\_id" : ObjectId("61a1b23aeb4f6cb4db6d94d1"), "rollno" : 8, "name" : "deep

, "subj" : "cn", "marks" : 70 }

{ "\_id" : ObjectId("61a1b242eb4f6cb4db6d94d2"), "rollno" : 9, "name" : "gene

, "subj" : "sepm", "marks" : 84 }

{ "\_id" : ObjectId("61a1b24beb4f6cb4db6d94d3"), "rollno" : 10, "name" : "ama

", "subj" : "sepm", "marks" : 77 }

> db.records.find().min({rollno:4}).pretty()

{

"\_id" : ObjectId("61a1b21aeb4f6cb4db6d94cd"),

"rollno" : 4,

"name" : "pallavi",

"subj" : "TOC",

"marks" : 70

}

{

"\_id" : ObjectId("61a1b224eb4f6cb4db6d94ce"),

"rollno" : 5,

"name" : "amruta",

"subj" : "db",

"marks" : 67

}

{

"\_id" : ObjectId("61a1b22ceb4f6cb4db6d94cf"),

"rollno" : 6,

"name" : "priti",

"subj" : "ISEE",

"marks" : 97

}

{

"\_id" : ObjectId("61a1b232eb4f6cb4db6d94d0"),

"rollno" : 7,

"name" : "diksha",

"subj" : "oop",

"marks" : 59

}

{

"\_id" : ObjectId("61a1b23aeb4f6cb4db6d94d1"),

"rollno" : 8,

"name" : "deepika",

"subj" : "cn",

"marks" : 70

}

{

"\_id" : ObjectId("61a1b242eb4f6cb4db6d94d2"),

"rollno" : 9,

"name" : "genelia",

"subj" : "sepm",

"marks" : 84

}

{

"\_id" : ObjectId("61a1b24beb4f6cb4db6d94d3"),

"rollno" : 10,

"name" : "amaraya",

"subj" : "sepm",

"marks" : 77

}

> db.records.find().max({rollno:4});

{ "\_id" : ObjectId("61a1b200eb4f6cb4db6d94ca"), "rollno" : 1, "name" : "saya

"subj" : "TOC", "marks" : 78 }

{ "\_id" : ObjectId("61a1b209eb4f6cb4db6d94cb"), "rollno" : 2, "name" : "pooj

"subj" : "TOC", "marks" : 65 }

{ "\_id" : ObjectId("61a1b212eb4f6cb4db6d94cc"), "rollno" : 3, "name" : "prac

"subj" : "TOC", "marks" : 80 }

> db.records.find().max({rollno:4}).pretty()

{

"\_id" : ObjectId("61a1b200eb4f6cb4db6d94ca"),

"rollno" : 1,

"name" : "sayali",

"subj" : "TOC",

"marks" : 78

}

{

"\_id" : ObjectId("61a1b209eb4f6cb4db6d94cb"),

"rollno" : 2,

"name" : "pooja",

"subj" : "TOC",

"marks" : 65

}

{

"\_id" : ObjectId("61a1b212eb4f6cb4db6d94cc"),

"rollno" : 3,

"name" : "prachi",

"subj" : "TOC",

"marks" : 80

}