A17) Aggregate function and indexing:

yashu@Yashu-Laptop:~$ mongo

MongoDB shell version v5.0.22

connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb

Implicit session: session { "id" : UUID("c53d7c1c-9115-4186-b7e6-72500a29c3a9") }

MongoDB server version: 5.0.22

================

Warning: the "mongo" shell has been superseded by "mongosh",

which delivers improved usability and compatibility.The "mongo" shell has been deprecated and will be removed in

an upcoming release.

For installation instructions, see

<https://docs.mongodb.com/mongodb-shell/install/>

================

---

The server generated these startup warnings when booting:

2023-11-05T14:01:23.566+05:30: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See <http://dochub.mongodb.org/core/prodnotes-filesystem>

2023-11-05T14:01:24.080+05:30: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted

2023-11-05T14:01:24.080+05:30: /sys/kernel/mm/transparent\_hugepage/enabled is 'always'. We suggest setting it to 'never'

---

> use assg10;

switched to db assg10

>

>

>

> db.students.insert({'rno':1,'name':'aaa','age':20,'marks':95});

WriteResult({ "nInserted" : 1 })

> db.students.insert({ 'rno': 2, 'name': 'bbb', 'age': 21, 'marks': 88 });

ert({ 'rno': 3, 'name': 'ccc', 'age': 22, 'marks': 75 });

db.students.insert({ 'rno':WriteResult({ "nInserted" : 1 })

4, 'name': 'ddd', 'age': 23, 'marks': 92 })> db.students.insert({ 'rno'db.students.insert({ 'rno': 3, 'name': 'ccc', 'age': 22, 'marks': 75 });

nsert({ 'rno': 5, 'name': 'eee', 'age': 20, 'marks': 85 }WriteResult({ "nInserted" : 1 })

);

db.students.insert({ 'rno': 6, 'name': '> db.students.insert({ 'rno': 4,db.students.insert({ 'rno': 4, 'name': 'ddd', 'age': 23, 'marks': 92 });

, 'marks': 78 });

db.students.insert({ 'rno': 7, 'name': WriteResult({ "nInserted" : 1 })

'ggg', 'age': 21, 'marks': 89 });

db.student> db.students.insert({ 'rno': 5, 'name': 'eee', 'age': 20, 'madb.students.insert({ 'rno': 5, 'name': 'eee', 'age': 20, 'marks': 85 });

'name': 'hhh', 'age': 24, 'marks': 96 });

db.studenWriteResult({ "nInserted" : 1 })

ts.insert({ 'rno': 9, 'name': 'iii', 'age':> db.students.insert({ 'rno':db.students.insert({ 'rno': 6, 'name': 'fff', 'age': 22, 'marks': 78 });

7 });

db.students.insert({ 'rno': 10, 'name': 'jjjWriteResult({ "nInserted" : 1 })

', 'age': 22, 'marks': 94 });> db.students.insert({ 'rno': 7, 'name': 'gdb.students.insert({ 'rno': 7, 'name': 'ggg', 'age': 21, 'marks': 89 });

WriteResult({ "nInserted" : 1 })

> db.students.insert({ 'rno': 8, 'name': 'hhh', 'age': 24, 'marks': 96 });

WriteResult({ "nInserted" : 1 })

> db.students.insert({ 'rno': 9, 'name': 'iii', 'age': 23, 'marks': 87 });

WriteResult({ "nInserted" : 1 })

> db.students.insert({ 'rno': 10, 'name': 'jjj', 'age': 22, 'marks': 94 });

WriteResult({ "nInserted" : 1 })

> db.student.find();

> db.students.find();

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "bbb", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4ce"), "rno" : 3, "name" : "ccc", "age" : 22, "marks" : 75 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d2"), "rno" : 7, "name" : "ggg", "age" : 21, "marks" : 89 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d3"), "rno" : 8, "name" : "hhh", "age" : 24, "marks" : 96 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d4"), "rno" : 9, "name" : "iii", "age" : 23, "marks" : 87 }

> db.students.find();

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "bbb", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4ce"), "rno" : 3, "name" : "ccc", "age" : 22, "marks" : 75 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d2"), "rno" : 7, "name" : "ggg", "age" : 21, "marks" : 89 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d3"), "rno" : 8, "name" : "hhh", "age" : 24, "marks" : 96 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d4"), "rno" : 9, "name" : "iii", "age" : 23, "marks" : 87 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

> db.students.createIndex({'marks':-1});

{

"numIndexesBefore" : 1,

"numIndexesAfter" : 2,

"createdCollectionAutomatically" : false,

"ok" : 1

}

> db.students.find({'marks':-1});

> db.students.find().sort({'marks':-1});

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d3"), "rno" : 8, "name" : "hhh", "age" : 24, "marks" : 96 }

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d2"), "rno" : 7, "name" : "ggg", "age" : 21, "marks" : 89 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "bbb", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d4"), "rno" : 9, "name" : "iii", "age" : 23, "marks" : 87 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4ce"), "rno" : 3, "name" : "ccc", "age" : 22, "marks" : 75 }

> db.students.find().sort({'marks':1});

{ "\_id" : ObjectId("654756dff1ac52e87b39f4ce"), "rno" : 3, "name" : "ccc", "age" : 22, "marks" : 75 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d4"), "rno" : 9, "name" : "iii", "age" : 23, "marks" : 87 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "bbb", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d2"), "rno" : 7, "name" : "ggg", "age" : 21, "marks" : 89 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d3"), "rno" : 8, "name" : "hhh", "age" : 24, "marks" : 96 }

> db.students.find({'name':'aaa'});

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

> db.students.getIndexes();

[

{

"v" : 2,

"key" : {

"\_id" : 1

},

"name" : "\_id\_"

},

{

"v" : 2,

"key" : {

"marks" : -1

},

"name" : "marks\_-1"

}

]

> db.students.dropIndex('marks');

{

"ok" : 0,

"errmsg" : "index not found with name [marks]",

"code" : 27,

"codeName" : "IndexNotFound"

}

> db.students.dropIndex('marks\_-1');

{ "nIndexesWas" : 2, "ok" : 1 }

> db.students.getIndexes();

[ { "v" : 2, "key" : { "\_id" : 1 }, "name" : "\_id\_" } ]

> db.students.getIndexes();

[ { "v" : 2, "key" : { "\_id" : 1 }, "name" : "\_id\_" } ]

> db.students.createIndex({'name':1,'age':-1});

{

"numIndexesBefore" : 1,

"numIndexesAfter" : 2,

"createdCollectionAutomatically" : false,

"ok" : 1

}

> db.students.getIndexes();

[

{

"v" : 2,

"key" : {

"\_id" : 1

},

"name" : "\_id\_"

},

{

"v" : 2,

"key" : {

"name" : 1,

"age" : -1

},

"name" : "name\_1\_age\_-1"

}

]

> db.students.find().sort({'name':1,'age':-1});

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "bbb", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4ce"), "rno" : 3, "name" : "ccc", "age" : 22, "marks" : 75 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d2"), "rno" : 7, "name" : "ggg", "age" : 21, "marks" : 89 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d3"), "rno" : 8, "name" : "hhh", "age" : 24, "marks" : 96 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d4"), "rno" : 9, "name" : "iii", "age" : 23, "marks" : 87 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

> db.students.updateOne({'rno':2},{$set:{'name':'aaa'}});

{ "acknowledged" : true, "matchedCount" : 1, "modifiedCount" : 1 }

> db.students.updateOne({'rno':3},{$set:{'name':'aaa'}});

{ "acknowledged" : true, "matchedCount" : 1, "modifiedCount" : 1 }

> db.students.find().sort({'name':1,'age':-1});

{ "\_id" : ObjectId("654756dff1ac52e87b39f4ce"), "rno" : 3, "name" : "aaa", "age" : 22, "marks" : 75 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "aaa", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d2"), "rno" : 7, "name" : "ggg", "age" : 21, "marks" : 89 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d3"), "rno" : 8, "name" : "hhh", "age" : 24, "marks" : 96 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d4"), "rno" : 9, "name" : "iii", "age" : 23, "marks" : 87 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

> db.students.deleteMany({'rno':3},{'rno':7},{'rno':8},{'rno':9});

{ "acknowledged" : true, "deletedCount" : 1 }

> db.students.find().sort({'name':1,'age':-1});

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "aaa", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d2"), "rno" : 7, "name" : "ggg", "age" : 21, "marks" : 89 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d3"), "rno" : 8, "name" : "hhh", "age" : 24, "marks" : 96 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d4"), "rno" : 9, "name" : "iii", "age" : 23, "marks" : 87 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

> db.students.remove({'rno':{$gte:7,$lte:9}});

WriteResult({ "nRemoved" : 3 })

> db.students.find().sort({'name':1,'age':-1});

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "aaa", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "eee", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

>

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

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

{ "\_id" : "ddd", "marks" : 85 }

{ "\_id" : "aaa", "marks" : 88 }

{ "\_id" : "jjj", "marks" : 94 }

> db.students.find();

{ "\_id" : ObjectId("654756a3f1ac52e87b39f4cc"), "rno" : 1, "name" : "aaa", "age" : 20, "marks" : 95 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cd"), "rno" : 2, "name" : "aaa", "age" : 21, "marks" : 88 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4cf"), "rno" : 4, "name" : "ddd", "age" : 23, "marks" : 92 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d0"), "rno" : 5, "name" : "ddd", "age" : 20, "marks" : 85 }

{ "\_id" : ObjectId("654756dff1ac52e87b39f4d1"), "rno" : 6, "name" : "fff", "age" : 22, "marks" : 78 }

{ "\_id" : ObjectId("654756e4f1ac52e87b39f4d5"), "rno" : 10, "name" : "jjj", "age" : 22, "marks" : 94 }

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

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

{ "\_id" : "ddd", "marks" : 92 }

{ "\_id" : "aaa", "marks" : 95 }

{ "\_id" : "jjj", "marks" : 94 }

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

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

{ "\_id" : "ddd", "marks" : 88.5 }

{ "\_id" : "aaa", "marks" : 91.5 }

{ "\_id" : "jjj", "marks" : 94 }

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

{ "\_id" : "ddd", "marks" : 177 }

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

{ "\_id" : "aaa", "marks" : 183 }

{ "\_id" : "jjj", "marks" : 94 }

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

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

{ "\_id" : "ddd", "marks" : 177 }

{ "\_id" : "aaa", "marks" : 183 }

{ "\_id" : "jjj", "marks" : 94 }

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

{ "\_id" : "fff", "count" : 78 }

{ "\_id" : "ddd", "count" : 177 }

{ "\_id" : "aaa", "count" : 183 }

{ "\_id" : "jjj", "count" : 94 }

> db.students.aggregate([{$group:{\_id:"$name",count:{$sum:1}}}]);

{ "\_id" : "fff", "count" : 1 }

{ "\_id" : "ddd", "count" : 2 }

{ "\_id" : "aaa", "count" : 2 }

{ "\_id" : "jjj", "count" : 1 }

> db.students.aggregate([{$match:{name:'aaa'}},{$group:{\_id:"$name",count:{$sum:1}}}]);

{ "\_id" : "aaa", "count" : 2 }

>