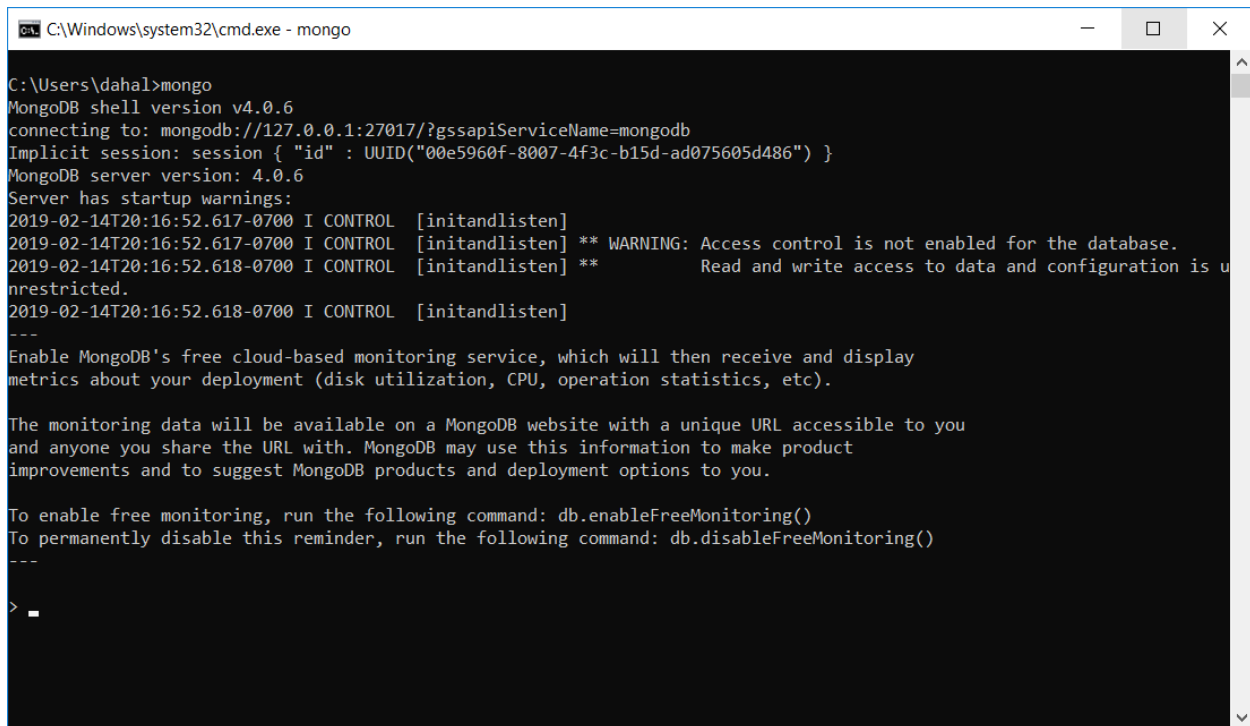


Workshop 3

Section A: Creating Collection and Insertion

Starting Mongo in cmd:



```
C:\Windows\system32\cmd.exe - mongo

C:\Users\dahal>mongo
MongoDB shell version v4.0.6
connecting to: mongodb://127.0.0.1:27017/?gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("00e5960f-8007-4f3c-b15d-ad075605d486") }
MongoDB server version: 4.0.6
Server has startup warnings:
2019-02-14T20:16:52.617-0700 I CONTROL [initandlisten]
2019-02-14T20:16:52.617-0700 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the database.
2019-02-14T20:16:52.618-0700 I CONTROL [initandlisten] **          Read and write access to data and configuration is u
nrestricted.
2019-02-14T20:16:52.618-0700 I CONTROL [initandlisten]
---
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---
> _
```

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Creating collection:

```
C:\Windows\system32\cmd.exe - mongo
C:\Users\dahal>mongo
MongoDB shell version v4.0.6
connecting to: mongodb://127.0.0.1:27017/?gssapiServiceName=mongod
Implicit session: session { "id" : UUID("00e5960f-8007-4f3c-b15d-ad075605d486") }
MongoDB server version: 4.0.6
Server has startup warnings:
2019-02-14T20:16:52.617-0700 I CONTROL [initandlisten]
2019-02-14T20:16:52.617-0700 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the database.
2019-02-14T20:16:52.618-0700 I CONTROL [initandlisten] **          Read and write access to data and configuration is u
nrestricted.
2019-02-14T20:16:52.618-0700 I CONTROL [initandlisten]
---
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---
> db.createCollection('firstCollection',{max: 20})
{ "ok" : 1 }
> show collections
deptCollection
firstCollection
mydb
>
```

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Inserting values:

```
C:\Windows\system32\cmd.exe - mongo
{ "ok" : 1 }
> show collections
deptCollection
firstCollection
mydb
> db.deptCollection.insert(
... {
...   deptno: 10,
...   dname: 'ACCOUNTING',
...   loc: 'NEW YORK',
...   employees: [
...     {
...       empno: 7782,
...       ename: 'CLARK',
...       job: 'MANAGER',
...       mgr: 7839,
...       hiredate: new Date('1989-06-09'),
...       sal: 2450
...     },
...     {
...       empno: 7839,
...       ename: 'KING',
...       job: 'PRESIDENT',
...       hiredate: new Date('1980-11-17'),
...       sal: 5000
...     },
...     {
...       empno: 7934,
...       ename: 'MILLER',
...       job: 'CLERK',
...       mgr: 7782,
...       hiredate: new Date('1985-01-23'),
...       sal: 1300
...     }
...   ]
... }
WriteResult({ "nInserted" : 1 })
>
```

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Inserting array of data.

```
Select C:\Windows\system32\cmd.exe - mongo
deptCollection
firstCollection
mydb
> db.deptCollection.insert(
... {
...   deptno: 20,
...   dname: 'RESEARCH',
...   loc: 'DALLAS',
...   employees: [
...     {
...       empno: 7876,
...       ename: 'ADAMS',
...       job: 'CLERK',
...       mgr: 7788,
...       hiredate: new Date(),
...       sal: 1100
...     },
...     {
...       empno: 7902,
...       ename: 'FORD',
...       job: 'ANALYST',
...       mgr: 7566,
...       hiredate: new Date('1991-12-03'),
...       sal: 3000
...     },
...     {
...       empno: 7066,
...       ename: 'JONES',
...       job: 'MANAGER',
...       mgr: 7839,
...       hiredate: new Date('1991-04-02'),
...       sal: 2975
...     },
...     {
...       empno: 7788,
...       ename: 'SCOTT',
...       job: 'ANALYST',
...       mgr: 7566,
...       hiredate: new Date('2015-10-16'),
...       sal: 3000
...     }
...   ]
... }
WriteResult({ "nInserted" : 1 })
>
```

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```
Select C:\Windows\system32\cmd.exe - mongo
...   ename: 'JAMES',
...   job: 'CLERK',
...   mgr: 7698,
...   hiredate: new Date('1981-12-03'),
...   sal: 950,
...   deptno: 30
... },
... {
...   empno: 7654,
...   ename: 'MARTIN',
...   job: 'SALESMAN',
...   mgr: 7698,
...   hiredate: new Date('1993-09-28'),
...   sal: 1250,
...   comm: 1400,
...   deptno: 30
... },
... {
...   empno: 7844,
...   ename: 'TURNER',
...   job: 'SALESMAN',
...   mgr: 7698,
...   hiredate: new Date('1981-09-08'),
...   sal: 1500,
...   comm: 0,
...   deptno: 30
... },
... {
...   empno: 7521,
...   ename: 'WARD',
...   job: 'SALESMAN',
...   mgr: 7698,
...   hiredate: new Date('1994-02-22'),
...   sal: 1250,
...   comm: 500,
...   deptno: 30
... }
... ]
BulkWriteResult({
  "writeErrors" : [ ],
  "writeConcernErrors" : [ ],
  "nInserted" : 6,
  "nUpserted" : 0,
  "nMatched" : 0,
  "nModified" : 0,
  "nRemoved" : 0,
  "upserted" : [ ]
})
>
```

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Querying a collection:

```
C:\Windows\system32\cmd.exe - mongo
{"writeErrors" : [ ],
 "writeConcernErrors" : [ ],
 "nInserted" : 6,
 "nUpserted" : 0,
 "nMatched" : 0,
 "nModified" : 0,
 "nRemoved" : 0,
 "upserted" : [ ]
}
> db.deptCollection.find({deptno:10}).pretty()
{
  "_id" : ObjectId("5c6976290318136da5fae336"),
  "deptno" : 10,
  "dname" : "ACCOUNTING",
  "loc" : "NEW YORK",
  "employees" : [
    {
      "empno" : 7782,
      "ename" : "CLARK",
      "job" : "MANAGER",
      "mgr" : 7839,
      "hiredate" : ISODate("1989-06-09T00:00:00Z"),
      "sal" : 2450
    },
    {
      "empno" : 7839,
      "ename" : "KING",
      "job" : "PRESIDENT",
      "hiredate" : ISODate("1980-11-17T00:00:00Z"),
      "sal" : 5000
    },
    {
      "empno" : 7934,
      "ename" : "MILLER",
      "job" : "CLERK",
      "mgr" : 7782,
      "hiredate" : ISODate("1985-01-23T00:00:00Z"),
      "sal" : 1300
    }
  ]
}
```

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```
C:\Windows\system32\cmd.exe - mongo

      "job" : "CLERK",
      "mgr" : 7782,
      "hiredate" : ISODate("1985-01-23T00:00:00Z"),
      "sal" : 1300
    }
  ]
}
> db.deptCollection.find({"employees.empno":7902}).pretty()
{
  "_id" : ObjectId("5c6976fc0318136da5fae337"),
  "deptno" : 20,
  "dname" : "RESEARCH",
  "loc" : "DALLAS",
  "employees" : [
    {
      "empno" : 7876,
      "ename" : "ADAMS",
      "job" : "CLERK",
      "mgr" : 7788,
      "hiredate" : ISODate("2019-02-17T15:00:12.371Z"),
      "sal" : 1100
    },
    {
      "empno" : 7902,
      "ename" : "FORD",
      "job" : "ANALYST",
      "mgr" : 7566,
      "hiredate" : ISODate("1991-12-03T00:00:00Z"),
      "sal" : 3000
    },
    {
      "empno" : 7066,
      "ename" : "JONES",
      "job" : "MANAGER",
      "mgr" : 7839,
      "hiredate" : ISODate("1991-04-02T00:00:00Z"),
      "sal" : 2975
    },
    {
      "empno" : 7788,
      "ename" : "SCOTT",
      "job" : "ANALYST",
      "mgr" : 7566,
      "hiredate" : ISODate("2015-10-16T00:00:00Z"),
      "sal" : 3000
    }
  ]
}
>
```

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({deptno:20},
...   { _id: 0, employees: {$elemMatch: {empno: 7902}}}).pretty()
{
  "employees" : [
    {
      "empno" : 7902,
      "ename" : "FORD",
      "job" : "ANALYST",
      "mgr" : 7566,
      "hiredate" : ISODate("1991-12-03T00:00:00Z"),
      "sal" : 3000
    }
  ]
}
>
```

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```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({deptno:20},
... { employees: {$elemMatch: {empno: 7902}}}).pretty()
{
  "_id" : ObjectId("5c6976fc0318136da5fae337"),
  "employees" : [
    {
      "empno" : 7902,
      "ename" : "FORD",
      "job" : "ANALYST",
      "mgr" : 7566,
      "hiredate" : ISODate("1991-12-03T00:00:00Z"),
      "sal" : 3000
    }
  ]
}
```

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({deptno:10},
... { employees: {$elemMatch: {sal: { $gt: 2000}}}}).pretty()
{
  "_id" : ObjectId("5c6976290318136da5fae336"),
  "employees" : [
    {
      "empno" : 7782,
      "ename" : "CLARK",
      "job" : "MANAGER",
      "mgr" : 7839,
      "hiredate" : ISODate("1989-06-09T00:00:00Z"),
      "sal" : 2450
    }
  ]
}
```


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```
C:\Windows\system32\cmd.exe - mongo

      "mgr" : 7839,
      "hiredate" : ISODate("1989-06-09T00:00:00Z"),
      "sal" : 2450
    }
  ]
}
> db.deptCollection.find({deptno:20}, { employees: {$elemMatch: {sal: { $gt: 2000}, job: "MANAGER"}}}).pretty()
{
  "_id" : ObjectId("5c6976fc0318136da5fae337"),
  "employees" : [
    {
      "empno" : 7066,
      "ename" : "JONES",
      "job" : "MANAGER",
      "mgr" : 7839,
      "hiredate" : ISODate("1991-04-02T00:00:00Z"),
      "sal" : 2975
    }
  ]
}
>
```

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({"employees.sal" : { $gt: 2000}}).pretty()
{
  "_id" : ObjectId("5c6976290318136da5fae336"),
  "deptno" : 10,
  "dname" : "ACCOUNTING",
  "loc" : "NEW YORK",
  "employees" : [
    {
      "empno" : 7782,
      "ename" : "CLARK",
      "job" : "MANAGER",
      "mgr" : 7839,
      "hiredate" : ISODate("1989-06-09T00:00:00Z"),
      "sal" : 2450
    },
    {
      "empno" : 7839,
      "ename" : "KING",
      "job" : "PRESIDENT",
      "hiredate" : ISODate("1980-11-17T00:00:00Z"),
      "sal" : 5000
    },
    {
      "empno" : 7934,
      "ename" : "MILLER",
      "job" : "CLERK",
      "mgr" : 7782,
      "hiredate" : ISODate("1985-01-23T00:00:00Z"),
      "sal" : 1300
    }
  ]
}
{
  "_id" : ObjectId("5c6976fc0318136da5fae337"),
  "deptno" : 20,
  "dname" : "RESEARCH",
  "loc" : "DALLAS",
  "employees" : [
    {
      "empno" : 7876,
      "ename" : "ADAMS",
      "job" : "CLERK",
      "mgr" : 7788,
      "hiredate" : ISODate("2019-02-17T15:00:12.371Z"),
      "sal" : 1100
    },
    {
      "empno" : 7902,
      "ename" : "FORD",

```

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```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({ "employees.job" : { $ne: "MANAGER" } }).pretty()
{
  "_id" : ObjectId("5c6977490318136da5fae338"),
  "deptno" : 40,
  "dname" : "OPERATIONS",
  "loc" : "BOSTON"
}
```

Aggregation Pipeline:

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.aggregate([ {
...   $project: {
...     empSet: {
...       $filter: {
...         input: "$employees",
...         as: "employee",
...         cond: { $gte: [ "$$employee.sal", 2000 ] }
...       }
...     }
...   }
... }).pretty()
{
  "_id" : ObjectId("5c6976290318136da5fae336"),
  "empSet" : [
    {
      "empno" : 7782,
      "ename" : "CLARK",
      "job" : "MANAGER",
      "mgr" : 7839,
      "hiredate" : ISODate("1989-06-09T00:00:00Z"),
      "sal" : 2450
    },
    {
      "empno" : 7839,
      "ename" : "KING",
      "job" : "PRESIDENT",
      "hiredate" : ISODate("1980-11-17T00:00:00Z"),
      "sal" : 5000
    }
  ]
}
{
  "_id" : ObjectId("5c6976fc0318136da5fae337"),
  "empSet" : [
    {
```

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Count:

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.aggregate({
...   "$project": {
...     "deptno": 1,
...     "Count": { "$size": { "$ifNull": [ "$employees", [] ] } }
...   }
... })
{ "_id" : ObjectId("5c6976290318136da5fae336"), "deptno" : 10, "Count" : 3 }
{ "_id" : ObjectId("5c6976fc0318136da5fae337"), "deptno" : 20, "Count" : 4 }
{ "_id" : ObjectId("5c6977490318136da5fae338"), "deptno" : 40, "Count" : 0 }
>
```

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Updating a Collection:

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.update({'deptno':40},
... {$set:
...   {'employees': [
...     {
...       empno: 8888,
...       ename: 'MARY',
...       job: 'LECTURER',
...       mgr: 7566,
...       hiredate: new Date(),
...       sal: 4000
...     },
...     {
...       empno: 9999,
...       ename: 'SUSAN',
...       job: 'LECTURER',
...       mgr: 7566,
...       hiredate: new Date(),
...       sal: 3000
...     }
...   ]}
... })
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
>
```

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.update({'deptno':40},
... {$set: {'loc': 'WOLVERHAMPTON'}})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
>
```

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```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({"deptno":40}).pretty()
{
  "_id" : ObjectId("5c6977490318136da5fae338"),
  "deptno" : 40,
  "dname" : "OPERATIONS",
  "loc" : "WOLVERHAMPTON",
  "employees" : [
    {
      "empno" : 8888,
      "ename" : "MARY",
      "job" : "LECTURER",
      "mgr" : 7566,
      "hiredate" : ISODate("2019-02-17T15:28:38.619Z"),
      "sal" : 4000
    },
    {
      "empno" : 9999,
      "ename" : "SUSAN",
      "job" : "LECTURER",
      "mgr" : 7566,
      "hiredate" : ISODate("2019-02-17T15:28:38.619Z"),
      "sal" : 3000
    }
  ]
}
```

Array of employees

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.update ( { deptno: 10 }, { $addToSet: {employees: {
...   empno: 5555,
...   ename: 'SANJIT',
...   job: 'LECTURER',
...   mgr: 8888,
...   hiredate: new Date(),
...   sal: 3500 } }
... })
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
>
```

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Delete:

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.update ( { deptno: 40 },
... { $pull: {employees: { empno: 8888 } } }
... )
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
>
```

Update:

```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({"deptno":40}).pretty()
{
  "_id" : ObjectId("5c6977490318136da5fae338"),
  "deptno" : 40,
  "dname" : "OPERATIONS",
  "loc" : "WOLVERHAMPTON",
  "employees" : [
    {
      "empno" : 9999,
      "ename" : "SUSAN",
      "job" : "LECTURER",
      "mgr" : 7566,
      "hiredate" : ISODate("2019-02-17T15:28:38.619Z"),
      "sal" : 3000
    }
  ]
}
>
```

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Updating an element in an array:

A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe - mongo". The window has a black background with white text. The text shows a MongoDB update command being executed:

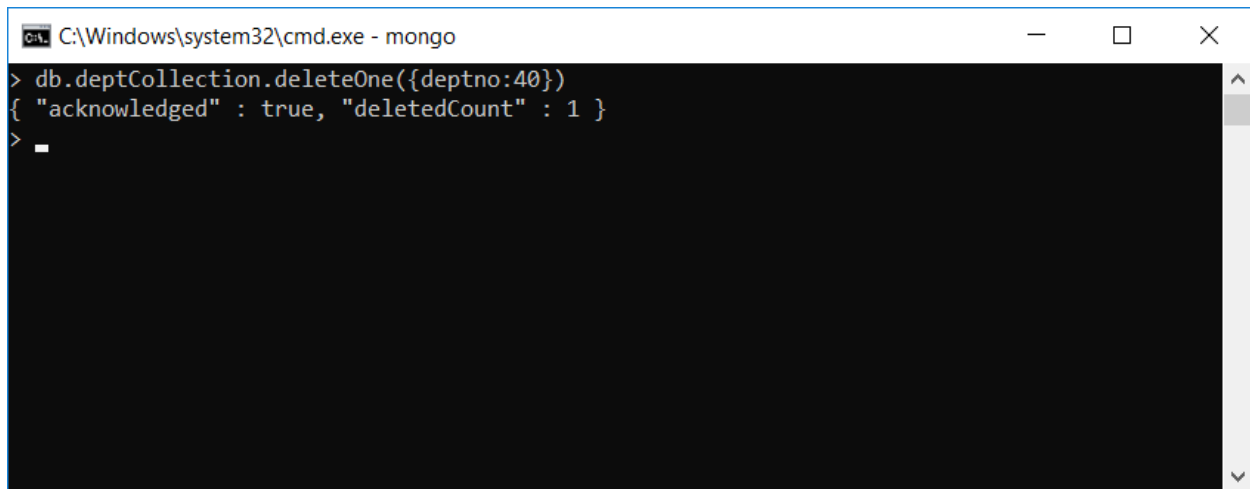
```
> db.deptCollection.update (
... { deptno: 10 , "employees.empno": 5555},
...   { $set: {"employees.$.job" : 'SENIOR LECTURER'} }
... )
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
> _
```

 The command updates the 'job' field of the employee with empno 5555 in the deptCollection to 'SENIOR LECTURER'. The result shows 1 document matched, 0 documents upserted, and 1 document modified. A cursor is visible on the line following the result.

```
> db.deptCollection.update (
... { deptno: 10 , "employees.empno": 5555},
...   { $set: {"employees.$.job" : 'SENIOR LECTURER'} }
... )
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
> _
```

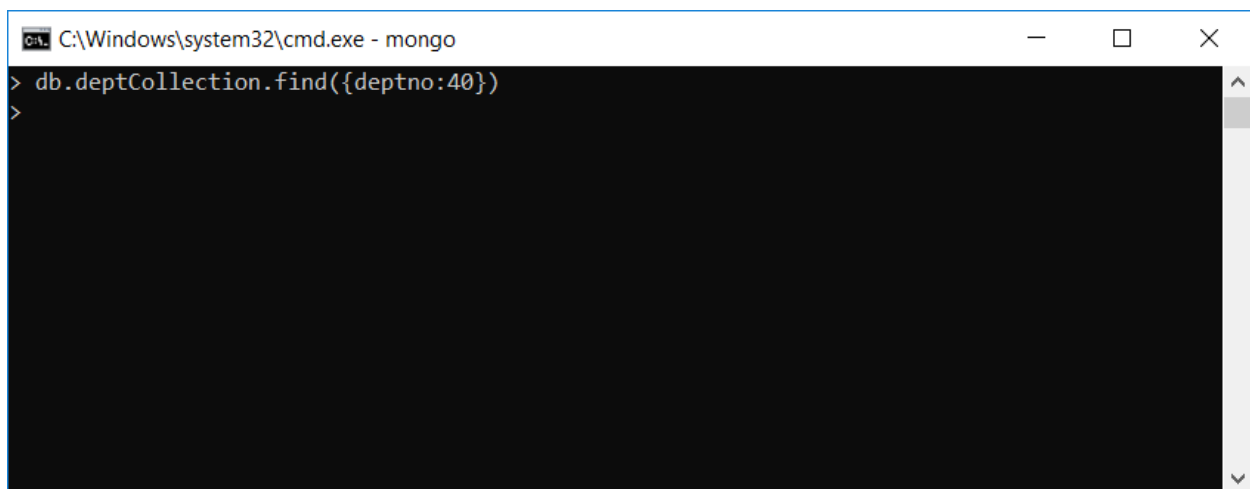
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Deletion:



```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.deleteOne({deptno:40})
{ "acknowledged" : true, "deletedCount" : 1 }
>
```

A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe - mongo". The window has a black background with white text. The first line shows a MongoDB command: `> db.deptCollection.deleteOne({deptno:40})`. The second line shows the output: `{ "acknowledged" : true, "deletedCount" : 1 }`. The prompt `>` is visible on the third line.



```
C:\Windows\system32\cmd.exe - mongo
> db.deptCollection.find({deptno:40})
>
```

A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe - mongo". The window has a black background with white text. The first line shows a MongoDB command: `> db.deptCollection.find({deptno:40})`. The second line shows the output: `>`, indicating that no documents were found. The prompt `>` is visible on the third line.

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Miscellaneous:

Adding objectIDs:

```
C:\Windows\system32\cmd.exe - mongo
> db.projCollection.insert(
... { _id: 10,
...   projno: 110,
...   proj_name: 'Oracle Project',
...   budget: 10000
... }
... )
WriteResult({ "nInserted" : 1 })
>
> db.projCollection.insert(
... { _id: 20,
...   projno: 120,
...   proj_name: 'MongoDB Project',
...   budget: 20000
... }
... )
WriteResult({ "nInserted" : 1 })
>
_
```

```
C:\Windows\system32\cmd.exe - mongo
> db.projCollection.insert(
... { _id: 10,
...   projno: 210,
...   proj_name: 'Other Oracle Project',
...   budget: 10000
... }
... )
WriteResult({
  "nInserted" : 0,
  "writeError" : {
    "code" : 11000,
    "errmsg" : "E11000 duplicate key error collection: test.projCollection index: _id_ dup key: { : 10.0 }"
  }
})
>
_
```

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```
C:\Windows\system32\cmd.exe - mongo
> db.projCollection.insert( {
...   projno: 140,
...   proj_name: 'ObjectId Project',
...   budget: 25000
... } )
WriteResult({ "nInserted" : 1 })
> _
```

```
C:\Windows\system32\cmd.exe - mongo
> db.projCollection.find({projno: 140}).pretty()
{
  "_id" : ObjectId("5c69806bf0ad6a93175faed3"),
  "projno" : 140,
  "proj_name" : "ObjectId Project",
  "budget" : 25000
}
>
```

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Using Variable:

```
C:\Windows\system32\cmd.exe - mongo
> var oid = db.projCollection.findOne({projno: 140})
> db.deptCollection.insert( {
...   deptno: 80,
...   dname: 'OID Test',
...   loc: 'WOLVERHAMPTON',
...   employees: [ {
...     empno: 9999,
...     ename: 'Sanjit',
...     project: oid
...   } ]
... }
... )
WriteResult({ "nInserted" : 1 })
> _
```