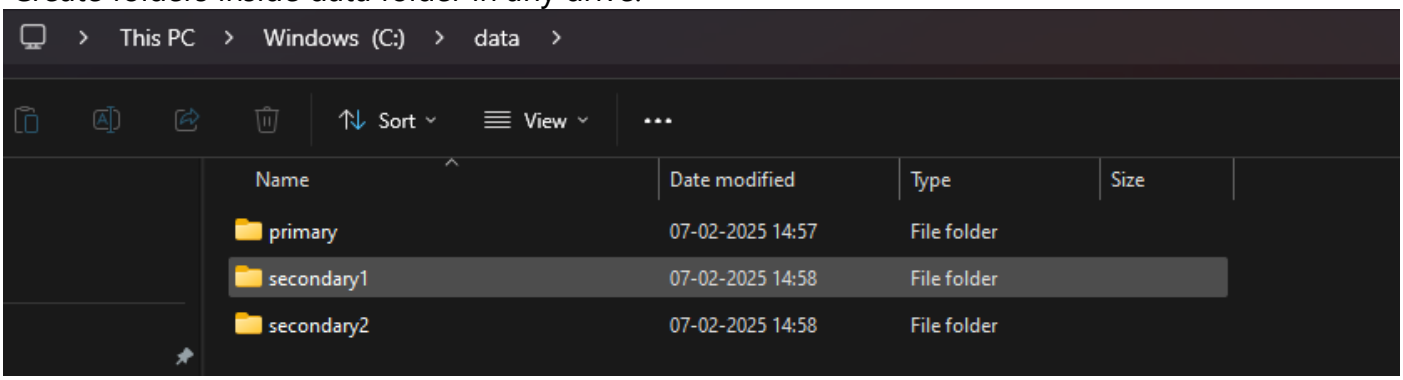
Shriyanshi Maurya | L024

PRACTICAL 5
REPLICATION USING MONGODB

You are a database administrator for a company, and you need to set up a MongoDB replica set to ensure high availability and data redundancy. Perform the following tasks:

- Initialize a replica set with three nodes on different ports (27017, 27018, 27019).
- Check the status of the replica set.
- Add a new secondary node to the existing replica set.
- Simulate a failover scenario by stepping down the primary and observing the election of a new primary.
- Check replication status and read from a secondary node using readPreference

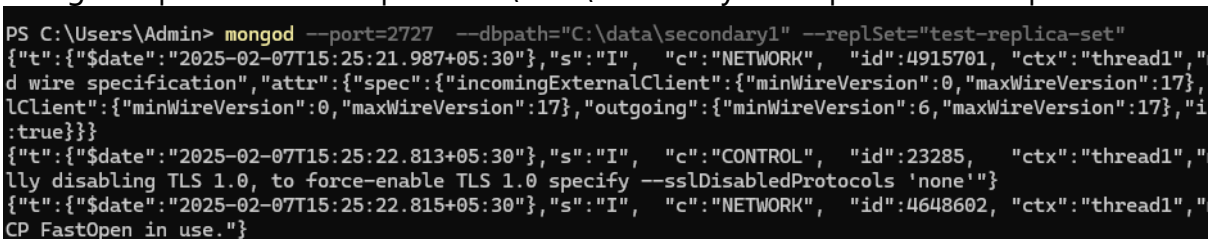
Create folders inside data folder in any drive.



Open Windows PowerShell ISE and execute the below commands.

mongod --port=2717 --dbpath="C:\data\primary" --replSet="text-replica-set"

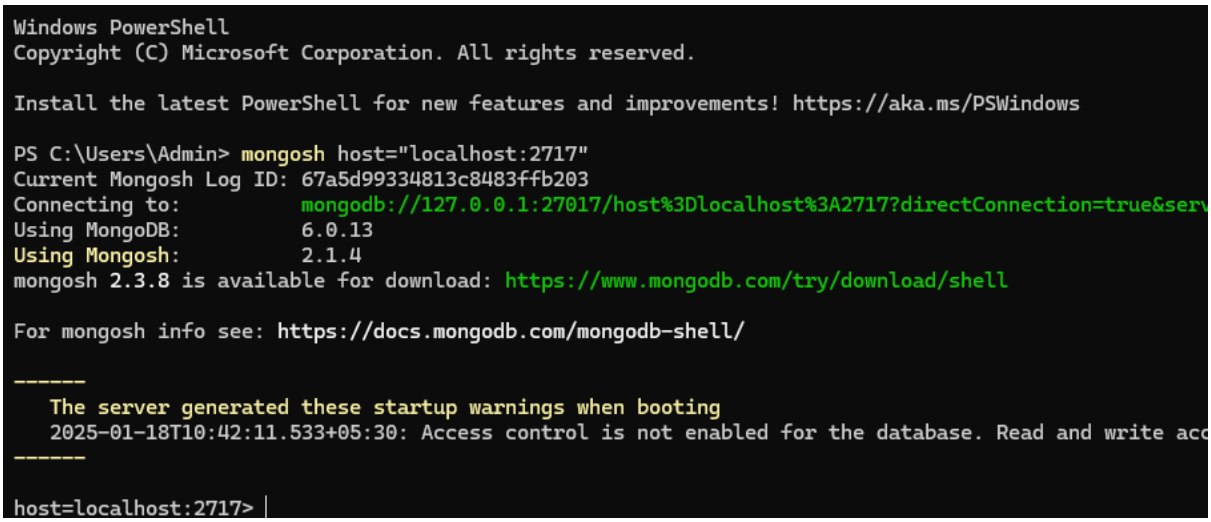
Open new shell and type the command
mongod --port=2727 --dbpath="C:\data\secondary1" --replSet="text-replica-set"



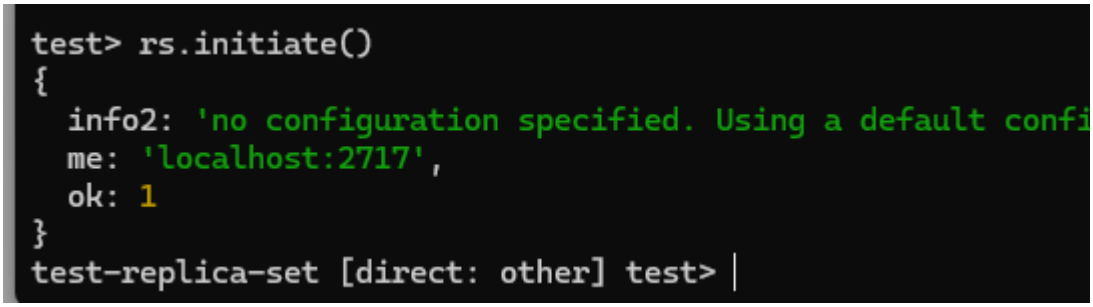
Open new shell and type the command
mongod --port=2737 --dbpath="C:\data\secondary2" --replSet="text-replica-set"

Initialization of primary server and adding secondary members to it

mongosh --host="localhost:2717"



rs.initiate();



To add configurations to primary server
rs.add({host:"localhost:2727"});

```
test-replica-set [direct: other] test> rs.add({host:"localhost:2727"})
{
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1738922805, i: 1 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1738922805, i: 1 })
```

rs.add({host:"localhost:2737"});

```
test-replica-set [direct: primary] test> rs.add({host:"localhost:2737"})
{
  ok: 1,
  '$clusterTime': {
    clusterTime: Timestamp({ t: 1738922839, i: 1 }),
    signature: {
      hash: Binary.createFromBase64('AAAAAAAAAAAAAAAAAAAAAAAAAAA=', 0),
      keyId: Long('0')
    }
  },
  operationTime: Timestamp({ t: 1738922839, i: 1 })
}
test-replica-set [direct: primary] test>
```

rs.status();

```
}
test-replica-set [direct: primary] test> rs.status()
{
  set: 'test-replica-set',
  date: ISODate('2025-02-07T10:09:29.871Z'),
  myState: 1,
  term: Long('1'),
  syncSourceHost: '',
  syncSourceId: -1,
  heartbeatIntervalMillis: Long('2000'),
  majorityVoteCount: 2,
```

mongosh --host="localhost:2727"

```
PS C:\Users\Admin> mongosh --host="localhost:2727"
Current Mongosh Log ID: 67a5dc739b1f7c03753892c3
Connecting to:          mongodb://localhost:2727/?directConnectio
1.4
Using MongoDB:          6.0.13
Using Mongosh:          2.1.4
mongosh 2.3.9 is available for download: https://www.mongodb.com/

For mongosh info see: https://docs.mongodb.com/mongodb-shell/

------
   The server generated these startup warnings when booting
   2025-02-07T15:25:22.852+05:30: Access control is not enabled f
iguration is unrestricted
   2025-02-07T15:25:22.852+05:30: This server is bound to localho
rver. Start the server with --bind_ip <address> to specify which
bind_ip_all to bind to all interfaces. If this behavior is desire
 this warning
------

test-replica-set [direct: secondary] test>
```

mongosh --host="localhost:2737"

```
PS C:\Users\Admin>  mongosh --host="localhost:2737"
Current Mongosh Log ID: 67a5dcaccc29d0e1cac27edb
Connecting to:          mongodb://localhost:2737/?directConn
1.4
Using MongoDB:          6.0.13
Using Mongosh:          2.1.4
mongosh 2.3.9 is available for download: https://www.mongodb

For mongosh info see: https://docs.mongodb.com/mongodb-shell

------
   The server generated these startup warnings when booting
   2025-02-07T15:26:59.324+05:30: Access control is not enab
iguration is unrestricted
   2025-02-07T15:26:59.324+05:30: This server is bound to lo
rver. Start the server with --bind_ip <address> to specify w
bind_ip_all to bind to all interfaces. If this behavior is d
 this warning
------

test-replica-set [direct: secondary] test>
```

Now, go to primary instance and type the following command
show dbs;

```
test-replica-set [direct: primary] test> show dbs
admin    80.00 KiB
config  176.00 KiB
local   404.00 KiB
test-replica-set [direct: primary] test>
```

Go to secondary1 and type the same command
show dbs;

```
test-replica-set [direct: secondary] test> show dbs
admin    80.00 KiB
config  220.00 KiB
local   404.00 KiB
test-replica-set [direct: secondary] test>
```

Go to secondary2 instance and type the same command
show dbs;

```
test-replica-set [direct: secondary] test> show dbs
admin    80.00 KiB
config  220.00 KiB
local   404.00 KiB
test-replica-set [direct: secondary] test>
```

Adding a database in primary server and creating a table with a record and using find()
use practice
db.books.insert({name:"think like a monk"})

```
test-replica-set [direct: primary] Shweta> db.books.insert({name:"think like a monk"})
DeprecationWarning: Collection.insert() is deprecated. Use insertOne, insertMany, or bulkWrite.
{
  acknowledged: true,
  insertedIds: { '0': ObjectId('67a5df2269a68aef79a7cc5d') }
}
```

```
test-replica-set [direct: primary] Shweta> db.books.insertMany([
... {  name:"Do not belive everything you think",
...    price:250},
... {  name:"Atomic Habbit",
...    price:200  },
... {  name:"Mindset",
...    price=150  }])
... ;
```

```
test-replica-set [direct: primary] Shweta> db.books.find()
[
  {
    _id: ObjectId('67a5df2269a68aef79a7cc5d'),
    name: 'think like a monk'
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5e'),
    name: 'Do not belive everything you think',
    price: 250
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5f'),
    name: 'Atomic Habbit',
    price: 200
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc60'),
    name: 'Mindset',
    price: 150
  }
]
test-replica-set [direct: primary] Shweta>
```

Now, updating the records..

```
test-replica-set [direct: primary] Shweta> db.books.updateOne({ name:"Mindset"}, { $set: { price:200}});
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
```

```
test-replica-set [direct: primary] Shweta> db.books.find()
[
  {
    _id: ObjectId('67a5df2269a68aef79a7cc5d'),
    name: 'think like a monk'
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5e'),
    name: 'Do not belive everything you think',
    price: 250
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5f'),
    name: 'Atomic Habbit',
    price: 200
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc60'),
    name: 'Mindset',
    price: 200
  }
]
```

Now , deleting the records..

```
test-replica-set [direct: primary] Shweta> db.books.deleteOne({ name:"mindset"})
{ acknowledged: true, deletedCount: 0 }
test-replica-set [direct: primary] Shweta>
```

Check if the records are visible in secondary1 and secondary2

```
test-replica-set [direct: secondary] Shweta> db.getMongo().setReadPref("secondaryPreferred")
```

```
test-replica-set [direct: secondary] Shweta> db.books.find();
[
  {
    _id: ObjectId('67a5df2269a68aef79a7cc5d'),
    name: 'think like a monk'
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5f'),
    name: 'Atomic Habbit',
    price: 200
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5e'),
    name: 'Do not belive everything you think',
    price: 250
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc60'),
    name: 'Mindset',
    price: 200
  }
]
```


```
test-replica-set [direct: secondary] Shweta> db.books.find();
[
  {
    _id: ObjectId('67a5df2269a68aef79a7cc5d'),
    name: 'think like a monk'
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5f'),
    name: 'Atomic Habbit',
    price: 200
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc5e'),
    name: 'Do not belive everything you think',
    price: 250
  },
  {
    _id: ObjectId('67a5e0f869a68aef79a7cc60'),
    name: 'Mindset',
    price: 200
  }
]
```