

PART 2.1.

Use the NYSE database to find the average price of stock_price_high values for each stock using MapReduce.

MAP FUNCTION:

```
> var map_part2_1 = function(){
... var key = this.stock_symbol;
... var value = this.stock_price_high;
... emit(key, value);
...};
```

REDUCE FUNCTION:

```
> var reduce_part2_1 = function(key, values){
... var obj = {count: 0, price: 0};
... values.forEach(function(value){
... obj.count += 1;
... obj.price += value;
... });
... return obj.price/obj.count;};
```

MAPREDUCE FUNCTION:

```
> db.nyse.mapReduce(map_part2_1, reduce_part2_1, {out:"part2_1_nyse_high_avg"})
```

RESULT SCREENSHOT:

```
> db.part2_1_nyse_high_avg.find()
{ "_id" : NaN, "value" : 14.348378816033216 }
{ "_id" : "AA", "value" : 38.895867471096054 }
{ "_id" : "AAI", "value" : 21.928555629805658 }
{ "_id" : "AAN", "value" : 7.841873356419183 }
{ "_id" : "AAP", "value" : 45.02059602368483 }
{ "_id" : "AAR", "value" : 22.843173042345565 }
{ "_id" : "AAV", "value" : 14.492371406896634 }
{ "_id" : "AB", "value" : 4.034083403457029 }
{ "_id" : "ABA", "value" : 25.344888423451213 }
{ "_id" : "ABB", "value" : 17.79383348028625 }
{ "_id" : "ABC", "value" : 23.226585158087968 }
{ "_id" : "ABD", "value" : 25.754212758858824 }
{ "_id" : "ABG", "value" : 17.714408907935564 }
{ "_id" : "ABK", "value" : 24.14180053804033 }
{ "_id" : "ABM", "value" : 22.92462169684987 }
{ "_id" : "ABR", "value" : 19.685612373752875 }
{ "_id" : "ABT", "value" : 45.76009362326584 }
{ "_id" : "ABV", "value" : 11.117206519895065 }
{ "_id" : "ABVT", "value" : 45.699579548764525 }
{ "_id" : "ABX", "value" : 4.829179081445888 }
Type it for more
```

PART 2.2.

Part 2.1 result will not be correct as AVERAGE is a commutative operation but nor associative. Use a FINALIZER to find the correct average.

MAP FUNCTION:

```
var map_part2_2 = function(){
... var key = this.stock_symbol;
... var value = {count : 1, price : this.stock_price_high};
... emit(key, value);
...};
```

REDUCE FUNCTION:

```
var reduce_part2_1 = function(key, values){
... var obj = {count: 0, price: 0};
... values.forEach(function(value){
... obj.count += value.count;
... obj.price += value.price;
... });
... return obj;};
```

FINALIZE FUNCTION:

```
var final_part2_2 = function(key, obj){
... obj.avg = obj.price/obj.count;
... return obj.avg;
...};
```

MAPREDUCE FUNCTION:

```
> db.nyse.mapReduce(map_part2_2,reduce_part2_1, {out:"part2_2_nyse_high_avg", finalize:final_part2_2})
```

RESULT SCREENSHOT:

```
[> db.part2_2_nyse_high_avg.find().limit(80).pretty()
{ "_id" : NaN, "value" : 14.350822478600747 }
{ "_id" : "AA", "value" : 52.459682054670246 }
{ "_id" : "AAI", "value" : 10.518446478515234 }
{ "_id" : "AAN", "value" : 19.847593646277623 }
{ "_id" : "AAP", "value" : 44.721311953352796 }
{ "_id" : "AAR", "value" : 19.208936170212834 }
{ "_id" : "AAV", "value" : 12.498480836236944 }
{ "_id" : "AB", "value" : 30.646272975432158 }
{ "_id" : "ABA", "value" : 25.994470198675494 }
{ "_id" : "ABB", "value" : 12.58361098604233 }
{ "_id" : "ABC", "value" : 47.7895740691136 }
{ "_id" : "ABD", "value" : 15.721916592724055 }
{ "_id" : "ABG", "value" : 15.429047379032308 }
{ "_id" : "ABK", "value" : 51.31720845792453 }
{ "_id" : "ABM", "value" : 24.528461061122712 }
{ "_id" : "ABR", "value" : 18.430806896551726 }
{ "_id" : "ABT", "value" : 48.188009450679914 }
{ "_id" : "ABV", "value" : 31.986431181486065 }
{ "_id" : "ABVT", "value" : 49.19672368421059 }
{ "_id" : "ABX", "value" : 22.683009677931274 }
Type "it" for more
> ]
```

PART 3.

Modify PART 2 by adding a finalizer to find out the average stock price of each price of all stocks in the finalizer.

MAP FUNCTION:

```
> var map_part3 = function(){
... var key = this.stock_symbol;
... var value = {count : 1,
... price_open : this.stock_price_open,
... price_high : this.stock_price_high,
... price_low : this.stock_price_low,
... price_close: this.stock_price_close,
... price_adj: this.stock_price_adj_close};
... emit(key, value);};
```

REDUCE FUNCTION:

```
> var reduce_part3= function(key, values){
... var obj = {count: 0,
... price_open : 0,
... price_high : 0,
... price_low : 0,
... price_close:0,
... price_adj:0 };
... values.forEach(function(value){
... obj.count += value.count;
... obj.price_open += value.price_open;
... obj.price_high += value.price_high;
... obj.price_low += value.price_low;
... obj.price_close += value.price_close;
... obj.price_adj += value.price_adj;
... });
... return obj;};
```

FINALIZE FUNCTION:

```
> var final_part3 = function(key, value){
... obj = {
... avg_price_open : value.price_open/value.count,
... avg_price_high : value.price_high/value.count,
... avg_price_low : value.price_low/value.count,
... avg_price_close : value.price_close/value.count,
... avg_price_adj : value.price_adj/value.count
... }
... return obj;
... };
```

MAPREDUCE FUNCTION:

```
> db.nyse.mapReduce(map_part3, reduce_part3,{out:"part3_nyse_all_price_avg", finalize:final_part3})
```

RESULT SCREENSHOT:

```

> db.nyse.mapReduce(map_part3, reduce_part3,{out:"part3_nyse_all_price_avg", finalize:finalize_part3})
{
    "result" : "part3_nyse_all_price_avg",
    "timeMillis" : 128751,
    "counts" : {
        "input" : 9211031,
        "emit" : 9211031,
        "reduce" : 95060,
        "output" : 2853
    },
    "ok" : 1
}
> show collections
access
games
movies
[number_movies_genre
number_movies_rating
number_movies_year
number_tag_movies
nyse
part2_1_nyse_high_avg
part2_2_nyse_high_avg
part3_nyse_all_price_avg
ratings
tags
webpage_ip
webpage_month
> db.part3_nyse_all_price_avg.find().limit(10).pretty()
{
    "_id" : NaN,
    "value" : {
        "avg_price_open" : 14.286665426125822,
        "avg_price_high" : 14.350822478600747,
        "avg_price_low" : 14.204417566058869,
        "avg_price_close" : 14.27483810941576,
        "avg_price_adj" : 10.319315221436558
    }
}
{
    "_id" : "AA",
    "value" : {
        "avg_price_open" : 51.914007762821214,
        "avg_price_high" : 52.459682054670246,
        "avg_price_low" : 51.37381451812719,
        "avg_price_close" : 51.91159715913802,
        "avg_price_adj" : 8.429698571310604
    }
}
{
    "_id" : "AAI",
    "value" : {
        "avg_price_open" : 10.267406559878014,
        "avg_price_high" : 10.518446478515234,
        "avg_price_low" : 10.008199847444757,
        "avg_price_close" : 10.268777015001353,
        "avg_price_adj" : 8.628881261123869
    }
}
{
    "_id" : "AAN",

```

PART 4 - MONGODB INDEXING

CREATE INDEX FOR A NEW COLLECTION NAMED NYSE_INDEX

```
[> db.nyse_index.createIndex({stock_symbol:1})
{
    "createdCollectionAutomatically" : true,
    "numIndexesBefore" : 1,
    "numIndexesAfter" : 2,
    "ok" : 1
}
[> show collections
movies
nyse
nyse_index
part6_1_top25
part6_3_number_ratings
part6_gender
ratings
users
[> db.nyse_index.find()
>
```

INSERT DATA INTO THIS COLLECTION

```
[LvdeMacBook-Pro:Desktop lvyan$ ./mongoimport-nyse.sh
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten] MongoDB starting : pid=18011 port=27017 dbpath=/data/db 64-bit host=LvdeMacBook-Pro.local
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten] db version v3.6.14
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten] git version: cbef87692475857c7ee6e764c8f5104b39c342a1
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten] OpenSSL version: OpenSSL 1.1.1c 28 May 2019
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten] allocator: system
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten] modules: none
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten] build environment:
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten]   distarch: x86_64
2019-10-09T15:58:58.756-0400 I CONTROL [initandlisten]   target_arch: x86_64
2019-10-09T15:58:58.757-0400 I CONTROL [initandlisten] options: {}
2019-10-09T15:58:58.759-0400 I STORAGE [initandlisten] exception in initAndListen: NonExistentPath: Data directory /data/db not found., terminating
2019-10-09T15:58:58.759-0400 I CONTROL [initandlisten] now exiting
2019-10-09T15:58:58.759-0400 I CONTROL [initandlisten] shutting down with code:100
/Users/lvyan/Desktop/NYSE/daily_prices_A.csv
2019-10-09T15:58:58.831-0400 connected to: localhost
2019-10-09T15:59:01.820-0400 [#####.....] HW2.nyse_index 9.03MB/39.1MB (23.1%)
2019-10-09T15:59:04.818-0400 [#####.....] HW2.nyse_index 20.0MB/39.1MB (51.1%)
2019-10-09T15:59:07.819-0400 [#####.....] HW2.nyse_index 31.1MB/39.1MB (79.5%)
2019-10-09T15:59:10.418-0400 [#####.....] HW2.nyse_index 39.1MB/39.1MB (100.0%)
2019-10-09T15:59:10.418-0400 imported 735026 documents
/Users/lvyan/Desktop/NYSE/daily_prices_B.csv
2019-10-09T15:59:10.445-0400 connected to: localhost
2019-10-09T15:59:13.448-0400 [#####.....] HW2.nyse_index 11.2MB/30.6MB (36.8%)
2019-10-09T15:59:16.443-0400 [#####.....] HW2.nyse_index 22.4MB/30.6MB (73.4%)
2019-10-09T15:59:18.644-0400 [#####.....] HW2.nyse_index 30.6MB/30.6MB (100.0%)
2019-10-09T15:59:18.644-0400 imported 577083 documents
/Users/lvyan/Desktop/NYSE/daily_prices_C.csv
2019-10-09T15:59:18.672-0400 connected to: localhost
2019-10-09T15:59:21.669-0400 [#####.....] HW2.nyse_index 10.1MB/43.7MB (23.1%)
2019-10-09T15:59:24.670-0400 [#####.....] HW2.nyse_index 20.8MB/43.7MB (47.7%)
2019-10-09T15:59:27.672-0400 [#####.....] HW2.nyse_index 32.4MB/43.7MB (74.3%)
2019-10-09T15:59:30.670-0400 [#####.....] HW2.nyse_index 42.0MB/43.7MB (96.2%)
2019-10-09T15:59:31.118-0400 [#####.....] HW2.nyse_index 43.7MB/43.7MB (100.0%)
2019-10-09T15:59:31.118-0400 imported 825935 documents
/Users/lvyan/Desktop/NYSE/daily_prices_D.csv
```

CHECK THE INDEX

```
[> db.nyse_index.getIndexKeys()
[ { "_id" : 1 }, { "stock_symbol" : 1 } ]
>
```

PROGRESS A SEARCH DETAILS BY USING EXPLAIN

```
> db.nyse_index.find({stock_symbol : "GOOD"}).explain()
{
    "queryPlanner" : {
        "plannerVersion" : 1,
        "namespace" : "HW2.nyse_index",
        "indexFilterSet" : false,
        "parsedQuery" : {
            "stock_symbol" : {
                "$eq" : "GOOD"
            }
        },
        "winningPlan" : {
            "stage" : "FETCH",
            "inputStage" : {
                "stage" : "IXSCAN",
                "keyPattern" : {
                    "stock_symbol" : 1
                },
                "indexName" : "stock_symbol_1", indexName
                "isMultiKey" : false,
                "multiKeyPaths" : {
                    "stock_symbol" : [ ]
                },
                "isUnique" : false,
                "isSparse" : false,
                "isPartial" : false,
                "indexVersion" : 2,
                "direction" : "forward",
                "indexBounds" : {
                    "stock_symbol" : [
                        "[\"GOOD\", \"GOOD\"]"
                    ]
                }
            }
        },
        "rejectedPlans" : [ ]
    },
    "serverInfo" : {
        "host" : "LVdeMacBook-Pro.local",
        "port" : 27017,
        "version" : "3.6.14",
        "gitVersion" : "cbef87692475857c7ee6e764c8f5104b39c342a1"
    },
    "ok" : 1
}
```

PART 5 - MONGODB INDEXING

CREATING A NEW DATABASE NAMED HW2 AND INSERT DATA INTO A COLLECTION NAMED NYSE IN THIS DATABASE.

```
< > mongoimport-nyse.sh > No Selection
```

```
1 cd /usr/local/Cellar/mongodb-community@3.6/3.6.14/bin
2 mongod
3 FILEPATH="/Users/lvyan/Desktop/NYSE/NYSE_daily_prices_*.csv";
4 for file in $FILEPATH;
5 do
6     echo $file;
7     mongoimport --db HW2 --collection nyse --type csv --headerline --file $file;
8 done
9

/Users/lvyan/Desktop/NYSE/NYSE_daily_prices_A.csv
2019-10-09T15:45:16.449-0400      connected to: localhost
2019-10-09T15:45:19.432-0400      [#####.....] HW2.nyse      8.23MB/39.1MB (21.1%)
2019-10-09T15:45:22.432-0400      [#####.....] HW2.nyse      19.5MB/39.1MB (50.0%)
2019-10-09T15:45:25.436-0400      [#####.....] HW2.nyse      25.5MB/39.1MB (65.2%)
2019-10-09T15:45:28.433-0400      [#####.....] HW2.nyse      31.7MB/39.1MB (81.0%)
2019-10-09T15:45:30.899-0400      [#####.....] HW2.nyse      39.1MB/39.1MB (100.0%)
2019-10-09T15:45:30.899-0400      imported 735026 documents
/Users/lvyan/Desktop/NYSE/NYSE_daily_prices_B.csv
2019-10-09T15:45:30.930-0400      connected to: localhost
2019-10-09T15:45:33.932-0400      [#####.....] HW2.nyse      10.2MB/30.6MB (33.3%)
2019-10-09T15:45:36.929-0400      [#####.....] HW2.nyse      17.1MB/30.6MB (55.9%)
2019-10-09T15:45:39.930-0400      [#####.....] HW2.nyse      27.3MB/30.6MB (89.2%)
2019-10-09T15:45:40.861-0400      [#####.....] HW2.nyse      30.6MB/30.6MB (100.0%)
2019-10-09T15:45:40.861-0400      imported 577083 documents
/Users/lvyan/Desktop/NYSE/NYSE_daily_prices_C.csv
```

```
[> show collections
  movies
  nyse
  part6_1_top25
  part6_3_number_ratings
  part6_gender
  ratings
  users
  [> db.nyse.findOne()
  {
      "_id" : ObjectId("5d9e38cc1c05e2f93fe00446"),
      "exchange" : "NYSE",
      "stock_symbol" : "AEA",
      "date" : "2010-02-05",
      "stock_price_open" : 4.42,
      "stock_price_high" : 4.54,
      "stock_price_low" : 4.22,
      "stock_price_close" : 4.41,
      "stock_volume" : 194300,
      "stock_price_adj_close" : 4.41
  }
  >
```

CREATE INDEX FOR THIS COLLECTION

```
> db.nyse.createIndex({stock_symbol:1})
```

RESULT SCREENSHOT

```
> db.nyse.createIndex({stock_symbol:1})
{
    "createdCollectionAutomatically" : false,
[      "numIndexesBefore" : 1,
      "numIndexesAfter" : 2,
      "ok" : 1
}
```

GET INDEX KEYS

```
> db.nyse.getIndexKeys()
[ { "_id" : 1 }, { "stock_symbol" : 1 } ]
> █
```

CREATE A COMPOUND INDEX

```
> db.nyse.createIndex({ "stock_symbol":1, "date":1 })
{
    "createdCollectionAutomatically" : false,
    "numIndexesBefore" : 2,
    "numIndexesAfter" : 3,
    "ok" : 1
}
> db.nyse.getIndexKeys()
[ {
    {
        "_id" : 1
    },
    {
        "stock_symbol" : 1
    },
    {
        "stock_symbol" : 1,
        "date" : 1
    }
]
> █
```

PART 6 - PROGRAMMING ASSIGNMENT

IMPORT 1M DATASET TO MONGODB

1. Create a database connection class for reusing

```

/**
 *
 * @author root
 */
public class DBConnection {
    public MongoCollection<Document> getConnection(String database, String collectionName){
        //1. CONNECT TO DB
        MongoClient connection = MongoClients.create();
        //2.
        MongoDatabase db = connection.getDatabase(database);
        //3.
        MongoCollection<Document> collection = db.getCollection(collectionName);

        System.out.println("connect successfull!");
        return collection;
    }
}

```

2. Import movies to database HW2, collection movies

Read data from a local file named “movies.dat”, read each line in this file and split a line by “::”, append each cell to document and insert each document into collection.

By the way, genres have a data type of list, so I use an arraylist to store genres for single movie temporary. And I split genre by blank.

```

private static void importMovies() throws FileNotFoundException, IOException {
    DBConnection connection = new DBConnection();
    MongoCollection<Document> collection = connection.getConnection("HW2", "movies");
    String pathname = "//Users//lvyan//Desktop//ml-1m//movies.dat";
    FileReader reader = new FileReader(pathname);
    BufferedReader br = new BufferedReader(reader);
    String line = "";
    while((line = br.readLine()) != null){
        String[] group = line.split("::");
        Movie m = new Movie();
        m.setMovieID(Integer.parseInt(group[0]));
        m.setMovieName(group[1]);
        String types = group[2];
        List<String> ts = new ArrayList<>();
        for(String type : types.split("\\|")){
            ts.add(type);
        }
        m.setMovieTypes(ts);

        //add to document
        Document doc = new Document();
        doc.append("MovieID", m.getMovieID());
        doc.append("Title", m.getMovieName());
        doc.append("Genres", m.getMovieTypes());
        collection.insertOne(doc);
    }
}

```

3. Import ratings to database HW2, collection ratings

Read data from a local file named “ratings.dat”, read each line in this file and split a line by “::”, append each cell to document and insert each document into collection.

```
private static void importRatings() throws FileNotFoundException, IOException {
    DBConnection connection = new DBConnection();
    MongoCollection<Document> collection = connection.getConnection("HW2", "ratings");
    String pathname = "//Users//lvyan//Desktop//ml-1m//ratings.dat";
    FileReader reader = new FileReader(pathname);
    BufferedReader br = new BufferedReader(reader);
    String line = "";
    System.out.println("read file successfully");

    while((line = br.readLine()) != null){
        String[] group = line.split("::");
        Document doc = new Document();
        doc.append("UserID", Integer.valueOf(group[0]));
        doc.append("MovieID", Integer.valueOf(group[1]));
        doc.append("Rating", Float.valueOf(group[2]));
        doc.append("Timestamp", group[3]);
        collection.insertOne(doc);
    }
}
```

4. Import users to database HW2, collection users

Read data from a local file named “uses.dat”, read each line in this file and split a line by “::”, append each cell to document and insert each document into collection.

```
private static void importUsers() throws FileNotFoundException, IOException {
    DBConnection connection = new DBConnection();
    MongoCollection collection = connection.getConnection("HW2", "users");

    String pathname = "//Users//lvyan//Desktop//ml-1m//users.dat";
    FileReader reader = new FileReader(pathname);
    BufferedReader br = new BufferedReader(reader);
    String line = "";
    System.out.println("read file successfully");

    while((line = br.readLine()) != null){
        String[] group = line.split("::");
        Document doc = new Document();
        doc.append("UserID", Integer.parseInt(group[0]));
        doc.append("Gender", group[1]);
        doc.append("Age", Integer.parseInt(group[2]));
        doc.append("Occupation", Integer.parseInt(group[3]));
        doc.append("Zip-code", group[4]);
        collection.insertOne(doc);
    }
}
```

5. Import result:

I get 3883 movies, 1000209 ratings and 6040 users.

```
[> db.movies.count()
3883
[> db.ratings.count()
1000209
[> db.users.count()
6040
> ]
```

TASK 1.1(BY NUMBERS). MAPREDUCE TO FIND THE TOP 25 RATED MOVIES IN THE
MOVIELENS DATASET

I used 3 ways to implement task 1. The first one is sorted by the number of rated for each movie. The last two ways are sorted by the average rating for each movie.

MAP FUNCTION

```
> var map_part6_1 = function(){
... var key = this.MovieID;
... var value = 1;
... emit(key, value);};
```

REDUCE FUNCTION

```
> var reduce_part6_1 = function(key, value){
... return Array.sum(value);
... };
```

MAPREDUCE FUNCTION

```
db.ratings.mapReduce(map_part6_1, reduce_part6_1, {out:"part6_1_top25"})
```

RESULT SCREENSHOT

```

> db.part6_1_top25.find().limit(25).sort({value:-1})
{ "_id" : 2858, "value" : 3428 }
{ "_id" : 260, "value" : 2991 }
[{"_id": 1196, "value": 2990}
{ "_id" : 1210, "value" : 2883 }
{ "_id" : 480, "value" : 2672 }
{ "_id" : 2028, "value" : 2653 }
{ "_id" : 589, "value" : 2649 }
{ "_id" : 2571, "value" : 2590 }
{ "_id" : 1270, "value" : 2583 }
{ "_id" : 593, "value" : 2578 }
{ "_id" : 1580, "value" : 2538 }
{ "_id" : 1198, "value" : 2514 }
{ "_id" : 608, "value" : 2513 }
{ "_id" : 2762, "value" : 2459 }
{ "_id" : 110, "value" : 2443 }
{ "_id" : 2396, "value" : 2369 }
{ "_id" : 1197, "value" : 2318 }
{ "_id" : 527, "value" : 2304 }
{ "_id" : 1617, "value" : 2288 }
{ "_id" : 1265, "value" : 2278 }
Type "it" for more
> it
{ "_id" : 1097, "value" : 2269 }
{ "_id" : 2628, "value" : 2250 }
[{"_id": 2997, "value": 2241}
{ "_id" : 318, "value" : 2227 }
{ "_id" : 858, "value" : 2223 }
>

```

TASK 1.2(BY RATINGS). MAPREDUCE TO FIND THE TOP 25 RATED MOVIES IN THE MOVIELENS DATASET

MAP FUNCTION

```

> var map_part6_1_2 = function(){
... var key = this.MovieID;
... var value = {count : 1, rating: this.Rating};
... emit(key, value);};

```

REDUCE FUNCTION

```

> var reduce_part6_1_2 = function(key, values){
... obj = {count: 0, rating: 0, avg:0};
... values.forEach(function(value){
... obj.count += value.count;
... obj.rating += value.rating;
... });
... return obj;
... };

```

FINALIZE FUNCTION:

```

var final_part6_1_2 = function(key, obj){
... obj.avg = obj.rating/obj.count;
... return obj.avg;
... };

```

MAPREDUCE FUNCTION:

```
> db.ratings.mapReduce(map_part6_1_2, reduce_part6_1_2, {out:"part6_1_2_byRating", finalize: final_part6_1_2})
```

RESULT SCREENSHOT

```
[> db.ratings.mapReduce(map_part6_1_2, reduce_part6_1_2, {out:"part6_1_2_byRating", [finalize: final_part6_1_2])  
{  
    "result" : "part6_1_2_byRating",  
    "timeMillis" : 17975,  
    "counts" : {  
        "input" : 1000209,  
        "emit" : 1000209,  
        "reduce" : 261958,  
        "output" : 3706  
    },  
    "ok" : 1  
}  
> show collections  
|movies  
nyse  
nyse_index  
part6_1_2_byRating  
part6_1_top25  
part6_3_number_ratings  
part6_gender  
ratings  
users  
> db.part6_1_2_byRating.find().limit(25).sort({value:-1})  
{ "_id" : 787, "value" : 5 }  
|{ "_id" : 989, "value" : 5 }  
{ "_id" : 1830, "value" : 5 }  
{ "_id" : 3172, "value" : 5 }  
{ "_id" : 3233, "value" : 5 }  
{ "_id" : 3280, "value" : 5 }  
{ "_id" : 3382, "value" : 5 }  
{ "_id" : 3697, "value" : 5 }  
{ "_id" : 3656, "value" : 5 }  
{ "_id" : 3881, "value" : 5 }  
{ "_id" : 3245, "value" : 4.8 }  
{ "_id" : 53, "value" : 4.75 }  
{ "_id" : 2503, "value" : 4.666666666666667 }  
{ "_id" : 2985, "value" : 4.608695652173913 }  
{ "_id" : 2019, "value" : 4.569509554140127 }  
{ "_id" : 318, "value" : 4.554557700942973 }  
{ "_id" : 858, "value" : 4.524966261808367 }  
{ "_id" : 745, "value" : 4.52054794520548 }  
{ "_id" : 50, "value" : 4.517106001121705 }  
{ "_id" : 527, "value" : 4.510416666666667 }  
Type "it" for more  
> it  
{ "_id" : 1148, "value" : 4.507936507936508 }  
|{ "_id" : 439, "value" : 4.5 }  
{ "_id" : 557, "value" : 4.5 }  
{ "_id" : 578, "value" : 4.5 }  
{ "_id" : 1795, "value" : 4.5 }  
> ]
```

TASK 1.3(BY PIPELINE). MAPREDUCE TO FIND THE TOP 25 RATED MOVIES IN THE MOVIELENS DATASET

PIPELINE FUNCTION:

```
db.ratings.aggregate([ { $group: { _id: "$MovieID", avg: { "$avg": "$Rating" } } }, { $sort: { avg: -1 } }, { $limit: 25 }, { $out : "pipeline" } ])
```

RESULT SCREENSHOT:

```

[> db.pipeline.find()
{ "_id" : 3280, "avg" : 5 }
{ "_id" : 3233, "avg" : 5 }
{ "_id" : 3656, "avg" : 5 }
{ "_id" : 3607, "avg" : 5 }
{ "_id" : 989, "avg" : 5 }
{ "_id" : 3881, "avg" : 5 }
{ "_id" : 787, "avg" : 5 }
{ "_id" : 3382, "avg" : 5 }
{ "_id" : 1830, "avg" : 5 }
{ "_id" : 3172, "avg" : 5 }
{ "_id" : 3245, "avg" : 4.8 }
{ "_id" : 53, "avg" : 4.75 }
{ "_id" : 2503, "avg" : 4.666666666666667 }
{ "_id" : 2905, "avg" : 4.608695652173913 }
{ "_id" : 2019, "avg" : 4.560509554140127 }
{ "_id" : 318, "avg" : 4.554557700942973 }
{ "_id" : 858, "avg" : 4.524966261808367 }
{ "_id" : 745, "avg" : 4.52054794520548 }
{ "_id" : 50, "avg" : 4.517106001121705 }
{ "_id" : 527, "avg" : 4.510416666666667 }
Type "it" for more
[> it
{ "_id" : 1148, "avg" : 4.507936507936508 }
{ "_id" : 1795, "avg" : 4.5 }
{ "_id" : 3517, "avg" : 4.5 }
{ "_id" : 578, "avg" : 4.5 }
{ "_id" : 439, "avg" : 4.5 }
>

```

TASK 2. MAPREDUCE TO FIND THE NUMBER OF MALES AND FEMALES IN THE MOVIELENS DATASET

MAP FUNCTION:

```

> var map_part6_2 = function(){
... var key = this.Gender;
... var value = 1;
... emit(key, value);
... };

```

REDUCE FUNCTION:

```

> var reduce_part6_2 = function(key, value){
... return Array.sum(value);
... };

```

MAPREDUCE FUNCTION:

```
> db.users.mapReduce(map_part6_2, reduce_part6_2, {out: "part6_gender"})
```

RESULT SCREENSHOT:

```
> db.users.mapReduce(map_part6_2, reduce_part6_2, {out:"part6_gender"})
{
    "result" : "part6_gender",
    "timeMillis" : 150,
    "counts" : {
        "input" : 6040,
        "emit" : 6040,
        "reduce" : 122,
        "output" : 2
    },
    "ok" : 1
}
[> show collections
movies
part6_gender
ratings
users
[> db.part6_gender.find().pretty()
{ "_id" : "F", "value" : 1709 }
{ "_id" : "M", "value" : 4331 }
> ]
```

TASK 3. MAPREDUCE TO FIND THE NUMBER OF MOVIES RATED BY DIFFERENT USERS

MAP FUNCTION:

```
> var map_part6_3 = function(){
... var key = this.UserID;
... var value = 1;
... emit(key, value);
... };
```

REDUCE FUNCTION:

```
> var reduce_part6_3 = function(key, value){
... return Array.sum(value);
... };
```

MAPREDUCE FUNCTION:

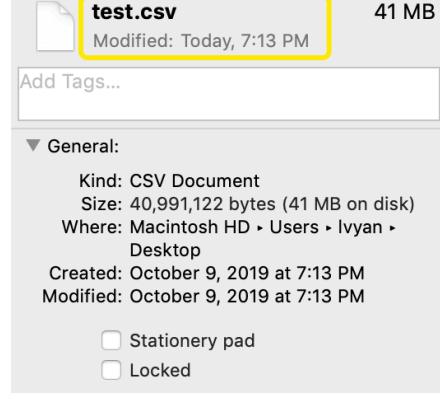
```
> db.ratings.mapReduce(map_part6_3, reduce_part6_3, {out: "part6_3_number_ratings" })
```

RESULT SCREENSHOT:

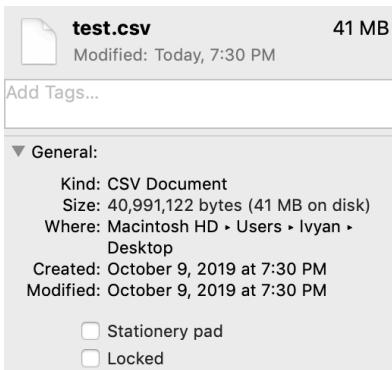
```
> db.part6_3_number_ratings.find()
[{"_id": 1, "value": 53}, {"_id": 2, "value": 129}, {"_id": 3, "value": 51}, {"_id": 4, "value": 21}, {"_id": 5, "value": 198}, {"_id": 6, "value": 71}, {"_id": 7, "value": 31}, {"_id": 8, "value": 139}, {"_id": 9, "value": 106}, {"_id": 10, "value": 401}, {"_id": 11, "value": 137}, {"_id": 12, "value": 23}, {"_id": 13, "value": 108}, {"_id": 14, "value": 25}, {"_id": 15, "value": 201}, {"_id": 16, "value": 35}, {"_id": 17, "value": 211}, {"_id": 18, "value": 305}, {"_id": 19, "value": 255}, {"_id": 20, "value": 24}]
Type "it" for more
> █
```

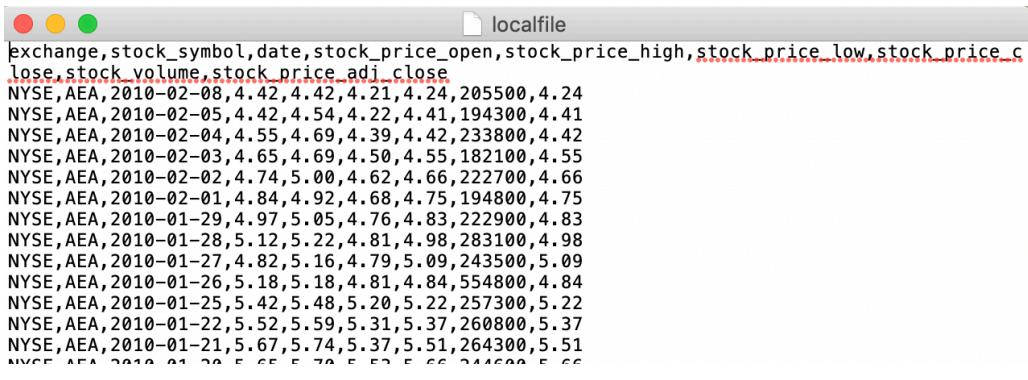
PART 7 - PROGRAMMING ASSIGNMENT

Chgrp Change the group of NYSE_daily_prices_A.csv to GROUP	<pre>Usage: hadoop fs [generic options] -chgrp [-R] GROUP PATH... [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -chgrp GROUP /Users/lvyan/HW2_hadoop 2019-10-09 19:06:02,210 WARN util.NativeCodeLoader: Unable to load native-had oses where applicable LVdeMacBook-Pro:bin lvyan\$]</pre> <hr/> <pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan/HW2_hadoop 2019-10-09 19:08:21,597 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform oses where applicable Found 2 items -rw-r--r-- 1 lvyan GROUP 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.cs -rw-r--r-- 1 lvyan supergroup 40991122 2019-10-09 18:58 /Users/lvyan/HW2_hadoop/test.csv</pre>
Chmod Change the permission to 777, which is shown as rwxrwxrwx	<pre>[LVdeMacBook-Pro:bin lvyan\$./hadoop fs -chmod -R 777 / 2019-10-09 00:52:19,152 WARN util.NativeCodeLoader: Unable to load na tive-hadoop library for your platform... using builtin-java classes w here applicable [LVdeMacBook-Pro:bin lvyan\$./hadoop fs -ls / 2019-10-09 00:52:34,584 WARN util.NativeCodeLoader: Unable to load na tive-hadoop library for your platform... using builtin-java classes w here applicable Found 2 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users drwxrwxrwx - lvyan supergroup 0 2019-10-03 15:42 /testdir LVdeMacBook-Pro:bin lvyan\$]</pre>
Chown Change the owner of file to 777	<pre>drwxrwxrwx - 777 supergroup 0 2019-10-09 00:37 /Users drwxrwxrwx - 777 supergroup 0 2019-10-03 15:42 /testdir [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -chown -R lvyan / 2019-10-09 12:08:55,992 WARN util.NativeCodeLoader: Unable to load native- ary for your platform... using builtin-java classes where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls / 2019-10-09 12:08:59,666 WARN util.NativeCodeLoader: Unable to load native- ary for your platform... using builtin-java classes where applicable Found 2 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users drwxrwxrwx - lvyan supergroup 0 2019-10-03 15:42 /testdir LVdeMacBook-Pro:bin lvyan\$]</pre>
copyFromLoca copy local file NYSE_daily_prices_A.csv to hdfs direction named HW2_hadoop	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -copyFromLocal /Users/lvyan/Desktop/NYSE/NYSE_daily_prices_A.csv /Users/lvyan/HW2_hadoop 2019-10-09 19:08:06,969 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java oses where applicable 2019-10-09 19:08:07,783 INFO sasl.SaslDataTransferClient: SASL encryption trust check: localHostTrusted = false, remoteHostTruste false [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan/HW2_hadoop 2019-10-09 19:08:21,597 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java oses where applicable Found 2 items -rw-r--r-- 1 lvyan GROUP 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv -rw-r--r-- 1 lvyan supergroup 40991122 2019-10-09 18:58 /Users/lvyan/HW2_hadoop/test.csv LVdeMacBook-Pro:bin lvyan\$]</pre>

copyToLocal copy test.csv to local file system	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -copyToLocal /Users/lvyan/HW2_hadoop/test.csv /Users/lvyan/Desktop 2019-10-09 19:13:17,214 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform sses where applicable 2019-10-09 19:13:18,023 INFO sasl.SaslDataTransferClient: SASL encryption trust check: localHostTrusted = false LVdeMacBook-Pro:bin lvyan\$]</pre>  <p>The screenshot shows a Mac OS X Finder window. At the top, there's a toolbar with icons for back, forward, and search. Below the toolbar, a list view shows one item: 'test.csv'. To the right of the file name, it says '41 MB'. Underneath the file name, it says 'Modified: Today, 7:13 PM'. Below the file list, there's a section titled 'General:' with details: 'Kind: CSV Document', 'Size: 40,991,122 bytes (41 MB on disk)', 'Where: Macintosh HD > Users > lvyan > Desktop', 'Created: October 9, 2019 at 7:13 PM', and 'Modified: October 9, 2019 at 7:13 PM'. There are also two checkboxes at the bottom: 'Stationery pad' and 'Locked'.</p>
Count Count the number of directories and files	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -count / 2019-10-09 19:14:51,226 WARN util.NativeCodeLoader: Unable to load native-h sses where applicable 5 2 81982114 / LVdeMacBook-Pro:bin lvyan\$ hadoop fs -count /Users/lvyan/HW2_hadoop 2019-10-09 19:15:07,759 WARN util.NativeCodeLoader: Unable to load native-h sses where applicable 1 2 81982114 /Users/lvyan/HW2_hadoop LVdeMacBook-Pro:bin lvyan\$]</pre>
Cp Copy a file named test.csv in HW2_hadoop to testdir	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /testdir 2019-10-09 19:17:49,768 WARN util.NativeCodeLoader: Unable to load native-hadoop lib ries where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -cp /Users/lvyan/HW2_hadoop/test.csv /testdir 2019-10-09 19:18:09,130 WARN util.NativeCodeLoader: Unable to load native-hadoop lib ries where applicable 2019-10-09 19:18:09,894 INFO sasl.SaslDataTransferClient: SASL encryption trust check false 2019-10-09 19:18:10,004 INFO sasl.SaslDataTransferClient: SASL encryption trust check false [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /testdir 2019-10-09 19:18:14,474 WARN util.NativeCodeLoader: Unable to load native-hadoop lib ries where applicable Found 1 items -rw-r--r-- 1 lvyan supergroup 40991122 2019-10-09 19:18 /testdir/test.csv LVdeMacBook-Pro:bin lvyan\$]</pre>

createSnapshot	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -createSnapshot /Users/lvyan/HW2_hadoop 2019-10-09 20:53:25,423 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-jav sses where applicable createSnapshot: Directory is not a snapshottable directory: /Users/lvyan/HW2_hadoop [LVdeMacBook-Pro:bin lvyan\$ hdfs dfsadmin -allowSnapshot /Users/lvyan/HW2_hadoop 2019-10-09 20:53:55,032 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-jav sses where applicable Allowing snapshot on /Users/lvyan/HW2_hadoop succeeded [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -createSnapshot /Users/lvyan/HW2_hadoop 2019-10-09 20:54:12,829 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-jav sses where applicable Created snapshot /Users/lvyan/HW2_hadoop/.snapshot/s20191009-205413.553 [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls -R /Users/lvyan/HW2_hadoop 2019-10-09 20:54:35,215 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-jav sses where applicable -rwxrwxrwx 1 lvyan supergroup 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv -rwxrwxrwx 1 lvyan supergroup 0 2019-10-09 19:59 /Users/lvyan/HW2_hadoop/t1.csv -rwxrwxrwx 2 lvyan supergroup 100 2019-10-09 20:15 /Users/lvyan/HW2_hadoop/test.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls -R /Users/lvyan/HW2_hadoop/.snapshot 2019-10-09 20:55:08,060 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-jav sses where applicable drwxrwxrwx - lvyan supergroup 0 2019-10-09 20:54 /Users/lvyan/HW2_hadoop/.snapshot/s20191009-205413.553 -rwxrwxrwx 1 lvyan supergroup 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/.snapshot/s20191009-205413.553/NYSE_dail _A.csv -rwxrwxrwx 1 lvyan supergroup 0 2019-10-09 19:59 /Users/lvyan/HW2_hadoop/.snapshot/s20191009-205413.553/t1.csv -rwxrwxrwx 2 lvyan supergroup 100 2019-10-09 20:15 /Users/lvyan/HW2_hadoop/.snapshot/s20191009-205413.553/test.csv [LVdeMacBook-Pro:bin lvyan\$]</pre>
deleteSnapshot	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls -R /Users/lvyan/HW2_hadoop/.snapshot 2019-10-09 21:08:48,794 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... sses where applicable drwxrwxrwx - lvyan supergroup 0 2019-10-09 20:54 /Users/lvyan/HW2_hadoop/.snapshot/s -rwxrwxrwx 1 lvyan supergroup 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/.snapshot/s/NYSE_dail -rwxrwxrwx 1 lvyan supergroup 0 2019-10-09 19:59 /Users/lvyan/HW2_hadoop/.snapshot/s/t1.csv -rwxrwxrwx 2 lvyan supergroup 100 2019-10-09 20:15 /Users/lvyan/HW2_hadoop/.snapshot/s/test.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -deleteSnapshot /Users/lvyan/HW2_hadoop/ 2019-10-09 21:09:58,155 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... sses where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls -R /Users/lvyan/HW2_hadoop/.snapshot 2019-10-09 21:09:55,565 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... sses where applicable LVdeMacBook-Pro:bin lvyan\$]</pre>
Df	<pre>LVdeMacBook-Pro:bin lvyan\$ hadoop fs -df / 2019-10-09 00:47:01,094 WARN util.NativeCodeLoader: Unable to load na tive-hadoop library for your platform... using builtin-java classes w here applicable Filesystem Size Used Available Use% hdfs://localhost:8020 250685575168 15774 48515325952 0%</pre>
Du	<pre>LVdeMacBook-Pro:bin lvyan\$ hadoop fs -du /Users/lvyan/HW2_hadoop 2019-10-09 19:23:38,044 WARN util.NativeCodeLoader: Unable to load nativ sses where applicable 40990992 40990992 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv 40991122 40991122 /Users/lvyan/HW2_hadoop/test.csv [LVdeMacBook-Pro:bin lvyan\$]</pre>
Dus	<pre>LVdeMacBook-Pro:bin lvyan\$ hadoop fs -dus /Users/lvyan/HW2_hadoop 2019-10-09 19:24:21,657 WARN util.NativeCodeLoader: Unable to load nativ sses where applicable dus: DEPRECATED: Please use 'du -s' instead. 81982114 81982114 /Users/lvyan/HW2_hadoop LVdeMacBook-Pro:bin lvyan\$]</pre>

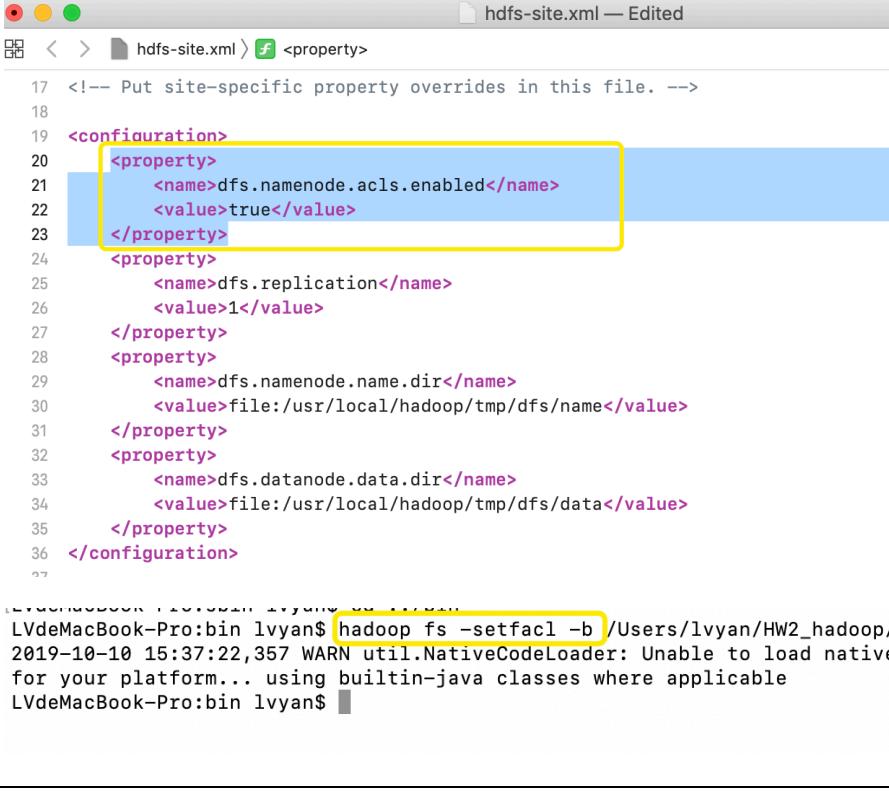
Expunge clean	[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -expunge 2019-10-09 19:25:10,199 WARN util.NativeCodeLoa sses where applicable LVdeMacBook-Pro:bin lvyan\$]
Find Find files named test.csv	[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -find / -iname test.csv -print 2019-10-09 19:28:59,138 WARN util.NativeCodeLoader: Unable to load native- libraries where applicable /Users/lvyan/HW2_hadoop/test.csv /testdir/test.csv LVdeMacBook-Pro:bin lvyan\$]
Get Copy a file to local file system named test.csv	/testdir/test.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -get /Users/lvyan/HW2_hadoop/test.csv /Users/lvyan/Desktop 2019-10-09 19:30:12,804 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your systems where applicable 2019-10-09 19:30:13,619 INFO sasl.SaslDataTransferClient: SASL encryption trust check: localHostTr false LVdeMacBook-Pro:bin lvyan\$] 
Getfacl	[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -getfacl /Users/lvyan/HW2_hadoop/test. 2019-10-09 19:31:24,741 WARN util.NativeCodeLoader: Unable to load native-h sses where applicable # file: /Users/lvyan/HW2_hadoop/test.csv # owner: lvyan # group: supergroup user::rw- group::r-- other::r-- LVdeMacBook-Pro:bin lvyan\$]
getattr	[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -getattr -d /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:17:43,358 WARN util.NativeCodeLoader: Unable to load native-hadoop libra sses where applicable # file: /Users/lvyan/HW2_hadoop/test.csv LVdeMacBook-Pro:bin lvyan\$]

	<pre>LVdeMacBook-Pro:bin lvyan\$ hadoop fs -getfattr -d /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:19:32,657 WARN util.NativeCodeLoader: Unable to load native-hadoop library sses where applicable # file: /Users/lvyan/HW2_hadoop/test.csv user.web="www.google.com" LVdeMacBook-Pro:bin lvyan\$</pre>																																																																																																																																																
Getmerge Merge the files in HW2_hadoop to a local file named localfile	<pre>LVdeMacBook-Pro:bin lvyan\$ hadoop fs -getmerge /Users/lvyan/HW2_hadoop /Users/lvyan/Desktop/localfile 2019-10-09 19:37:55,620 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platfo r sses where applicable 2019-10-09 19:37:56,392 INFO sasl.SaslDataTransferClient: SASL encryption trust check: localHostTrusted false LVdeMacBook-Pro:bin lvyan\$</pre>  <table border="1"> <thead> <tr> <th>exchange</th> <th>stock_symbol</th> <th>date</th> <th>stock_price_open</th> <th>stock_price_high</th> <th>stock_price_low</th> <th>stock_price_c lose</th> <th>stock_volume</th> <th>stock_price_adj_close</th> </tr> </thead> <tbody> <tr><td>NYSE</td><td>AEA</td><td>2010-02-08</td><td>4.42</td><td>4.42</td><td>4.21</td><td>4.24</td><td>205500</td><td>4.24</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-02-05</td><td>4.42</td><td>4.54</td><td>4.22</td><td>4.41</td><td>194300</td><td>4.41</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-02-04</td><td>4.55</td><td>4.69</td><td>4.39</td><td>4.42</td><td>233800</td><td>4.42</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-02-03</td><td>4.65</td><td>4.69</td><td>4.50</td><td>4.55</td><td>182100</td><td>4.55</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-02-02</td><td>4.74</td><td>5.00</td><td>4.62</td><td>4.66</td><td>222700</td><td>4.66</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-02-01</td><td>4.84</td><td>4.92</td><td>4.68</td><td>4.75</td><td>194800</td><td>4.75</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-29</td><td>4.97</td><td>5.05</td><td>4.76</td><td>4.83</td><td>222900</td><td>4.83</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-28</td><td>5.12</td><td>5.22</td><td>4.81</td><td>4.98</td><td>283100</td><td>4.98</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-27</td><td>4.82</td><td>5.16</td><td>4.79</td><td>5.09</td><td>243500</td><td>5.09</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-26</td><td>5.18</td><td>5.18</td><td>4.81</td><td>4.84</td><td>554800</td><td>4.84</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-25</td><td>5.42</td><td>5.48</td><td>5.20</td><td>5.22</td><td>257300</td><td>5.22</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-22</td><td>5.52</td><td>5.59</td><td>5.31</td><td>5.37</td><td>260800</td><td>5.37</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-21</td><td>5.67</td><td>5.74</td><td>5.37</td><td>5.51</td><td>264300</td><td>5.51</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-20</td><td>5.65</td><td>5.70</td><td>5.53</td><td>5.66</td><td>244600</td><td>5.66</td></tr> <tr><td>NYSE</td><td>AEA</td><td>2010-01-19</td><td>5.54</td><td>5.70</td><td>5.54</td><td>5.65</td><td>244600</td><td>5.66</td></tr> </tbody> </table>	exchange	stock_symbol	date	stock_price_open	stock_price_high	stock_price_low	stock_price_c lose	stock_volume	stock_price_adj_close	NYSE	AEA	2010-02-08	4.42	4.42	4.21	4.24	205500	4.24	NYSE	AEA	2010-02-05	4.42	4.54	4.22	4.41	194300	4.41	NYSE	AEA	2010-02-04	4.55	4.69	4.39	4.42	233800	4.42	NYSE	AEA	2010-02-03	4.65	4.69	4.50	4.55	182100	4.55	NYSE	AEA	2010-02-02	4.74	5.00	4.62	4.66	222700	4.66	NYSE	AEA	2010-02-01	4.84	4.92	4.68	4.75	194800	4.75	NYSE	AEA	2010-01-29	4.97	5.05	4.76	4.83	222900	4.83	NYSE	AEA	2010-01-28	5.12	5.22	4.81	4.98	283100	4.98	NYSE	AEA	2010-01-27	4.82	5.16	4.79	5.09	243500	5.09	NYSE	AEA	2010-01-26	5.18	5.18	4.81	4.84	554800	4.84	NYSE	AEA	2010-01-25	5.42	5.48	5.20	5.22	257300	5.22	NYSE	AEA	2010-01-22	5.52	5.59	5.31	5.37	260800	5.37	NYSE	AEA	2010-01-21	5.67	5.74	5.37	5.51	264300	5.51	NYSE	AEA	2010-01-20	5.65	5.70	5.53	5.66	244600	5.66	NYSE	AEA	2010-01-19	5.54	5.70	5.54	5.65	244600	5.66
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NYSE	AEA	2010-01-19	5.54	5.70	5.54	5.65	244600	5.66																																																																																																																																									
Head The head for a file named test.csv	<pre>LVdeMacBook-Pro:bin lvyan\$ hadoop fs -head /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 19:39:39,384 WARN util.NativeCodeLoader: Unable to load native-hadoop library sses where applicable 2019-10-09 19:39:40,121 INFO sasl.SaslDataTransferClient: SASL encryption trust false exchange,stock_symbol,date,stock_price_open,stock_price_high,stock_price_low,stock_price_c lose,stock_symbol.date,stock price open,stock price hiah,stock price_low,st NYSE,AEA,2010-02-08,4.42,4.42,4.21,4.24,205500,4.24 NYSE,AEA,2010-02-05,4.42,4.54,4.22,4.41,194300,4.41 NYSE,AEA,2010-02-04,4.55,4.69,4.39,4.42,233800,4.42 NYSE,AEA,2010-02-03,4.65,4.69,4.50,4.55,182100,4.55 NYSE,AEA,2010-02-02,4.74,5.00,4.62,4.66,222700,4.66 NYSE,AEA,2010-02-01,4.84,4.92,4.68,4.75,194800,4.75 NYSE,AEA,2010-01-29,4.97,5.05,4.76,4.83,222900,4.83 NYSE,AEA,2010-01-28,5.12,5.22,4.81,4.98,283100,4.98 NYSE,AEA,2010-01-27,4.82,5.16,4.79,5.09,243500,5.09 NYSE,AEA,2010-01-26,5.18,5.18,4.81,4.84,554800,4.84 NYSE,AEA,2010-01-25,5.42,5.48,5.20,5.22,257300,5.22 NYSE,AEA,2010-01-22,5.52,5.59,5.31,5.37,260800,5.37 NYSE,AEA,2010-01-21,5.67,5.74,5.37,5.51,264300,5.51 NYSE,AEA,2010-01-20,5.65,5.70,5.53,5.66,244600,5.66 NYSE,AEA,2010-01-19,5.54,5.70,5.54,5.65,244600,5.66 LVdeMacBook-Pro:bin lvyan\$</pre>																																																																																																																																																

Help	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -help 2019-10-09 19:40:13,887 WARN util.NativeCodeLoader: Unable to load native-h sses where applicable Usage: hadoop fs [generic options] [-appendToFile <localsrc> ... <dst>] [-cat [-ignoreCrc] <src> ...] [-checksum <src> ...] [-chgrp [-R] GROUP PATH...] [-chmod [-R] <MODE[,MODE]... OCTALMODE> PATH...] [-chown [-R] [OWNER][:[GROUP]] PATH...] [-copyFromLocal [-f] [-p] [-l] [-d] [-t <thread count>] <localsrc> [-copyToLocal [-f] [-p] [-ignoreCrc] [-crc] <src> ... <localdst>] [-count [-q] [-h] [-v] [-t [<storage type>]] [-u] [-x] [-e] <path> [-cp [-f] [-p -p[topax]] [-d] <src> ... <dst>] [-createSnapshot <snapshotDir> [<snapshotName>]] [-deleteSnapshot <snapshotDir> <snapshotName>] [-df [-h] [<path> ...]] [-du [-s] [-h] [-v] [-x] <path> ...]</pre>
Ls	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls / 2019-10-09 16:56:52,289 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable Found 2 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users drwxrwxrwx - lvyan supergroup 0 2019-10-03 15:42 /testdir LVdeMacBook-Pro:bin lvyan\$</pre>
Lsr	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -lsr / 2019-10-09 16:58:00,756 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built in-java classes where applicable lsr: DEPRECATED: Please use 'ls -R' instead. drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users/lvyan drwxrwxrwx - lvyan supergroup 0 2019-10-09 11:54 /Users/lvyan/Desktop drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users/lvyan/Desktop/NYSE -rw-r--r-- 1 lvyan supergroup 3451 2019-10-09 00:41 /Users/lvyan/Desktop/NYSE_daily_prices_A.csv -rw-r--r-- 1 lvyan supergroup 3451 2019-10-09 11:56 /Users/lvyan/Desktop/access.log drwxrwxrwx - lvyan supergroup 0 2019-10-03 15:42 /testdir LVdeMacBook-Pro:bin lvyan\$</pre>
Mkdir	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -mkdir /Users/lvyan/HW2_hadoop 2019-10-09 17:04:37,169 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your in-java classes where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls / 2019-10-09 17:24:48,133 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your in-java classes where applicable Found 2 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users drwxrwxrwx - lvyan supergroup 0 2019-10-03 15:42 /testdir [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan 2019-10-09 17:25:05,006 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your in-java classes where applicable Found 2 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 17:23 /Users/lvyan/Desktop drwxr-xr-x - lvyan supergroup 0 2019-10-09 17:04 /Users/lvyan/HW2_hadoop LVdeMacBook-Pro:bin lvyan\$</pre>

<p>moveFromLocal</p> <p>move a local file named NSYE_daily_price_A.csv to hdfs direction named HW2_hadoop</p>	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -moveFromLocal /Users/lvyan/Desktop/NYSE_daily_prices_A.csv /Users/lvyan/HW2_hadoop 2019-10-09 17:26:39,639 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable 2019-10-09 17:26:40,527 INFO sasl.SaslDataTransferClient: SASL encryption trust check: localHostTrusted = false, remoteHostTrusted = false LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan/HW2_hadoop 2019-10-09 17:28:55,123 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable Found 1 items -rw-r--r-- 1 lvyan supergroup 40990992 2019-10-09 17:26 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv LVdeMacBook-Pro:bin lvyan\$]</pre>
<p>moveToLocal</p> <p>move NSYE_daily_price_A.csv to local file system</p>	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -moveToLocal /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv /Users/lvyan/Desktop/NYSE 2019-10-09 18:30:42,272 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable moveToLocal: Option '-moveToLocal' is not implemented yet. LVdeMacBook-Pro:bin lvyan\$]</pre>
<p>Mv</p> <p>Move a file named NSYE_daily_price_A.csv in HW2_hadoop to another directory named testdir</p>	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -mv /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv /testdir 2019-10-09 18:33:07,717 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /testdir 2019-10-09 18:33:59,711 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable Found 1 items -rw-r--r-- 1 lvyan supergroup 40990992 2019-10-09 17:26 /testdir/NYSE_daily_prices_A.csv LVdeMacBook-Pro:bin lvyan\$]</pre>
<p>Put</p> <p>Upload a local file to hdfs</p>	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -put /Users/lvyan/Desktop/NYSE_daily_prices_B.csv /Users/lvyan/HW2_hadoop 2019-10-09 18:41:17,455 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable 2019-10-09 18:41:18,269 INFO sasl.SaslDataTransferClient: SASL encryption trust check: localHostTrusted = false, remoteHostTrusted = false LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan/HW2_hadoop 2019-10-09 18:41:52,123 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable Found 1 items -rw-r--r-- 1 lvyan supergroup 32034760 2019-10-09 18:41 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_B.csv LVdeMacBook-Pro:bin lvyan\$]</pre>
<p>renameSnapshot</p>	<pre>sses where applicable drwxrwxrwx - lvyan supergroup 0 2019-10-09 20:54 /Users/lvyan/HW2_hadoop/.snapshot/[20191009-205413.55] -rwxrwxrwx 1 lvyan supergroup 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/.snapshot/[20191009-205413.55]/NYSE_daily_prices_A.csv -rwxrwxrwx 1 lvyan supergroup 0 2019-10-09 19:59 /Users/lvyan/HW2_hadoop/.snapshot/[20191009-205413.55]/t1.csv -rwxrwxrwx 2 lvyan supergroup 100 2019-10-09 20:15 /Users/lvyan/HW2_hadoop/.snapshot/[20191009-205413.55]/test.csv LVdeMacBook-Pro:bin lvyan\$ hadoop fs -renameSnapshot /Users/lvyan/HW2_hadoop/s20191009-205413.553 s 2019-10-09 21:02:14,620 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls -R /Users/lvyan/HW2_hadoop/.snapshot 2019-10-09 21:02:27,008 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable drwxrwxrwx - lvyan supergroup 0 2019-10-09 20:54 /Users/lvyan/HW2_hadoop/.snapshot/s/[NYSE_daily_prices_A.csv -rwxrwxrwx 1 lvyan supergroup 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/.snapshot/s/[NYSE_daily_prices_A.csv -rwxrwxrwx 1 lvyan supergroup 0 2019-10-09 19:59 /Users/lvyan/HW2_hadoop/.snapshot/s/[t1.csv -rwxrwxrwx 2 lvyan supergroup 100 2019-10-09 20:15 /Users/lvyan/HW2_hadoop/.snapshot/s/[test.csv LVdeMacBook-Pro:bin lvyan\$]</pre>

Rm	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan/HW2_hadoop 2019-10-09 18:41:52,123 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable Found 1 items -rw-r--r-- 1 lvyan supergroup 32034760 2019-10-09 18:41 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_B.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -rm /Users/lvyan/HW2_hadoop/NYSE_daily_prices_B.csv 2019-10-09 18:43:28,986 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable Deleted /Users/lvyan/HW2_hadoop/NYSE_daily_prices_B.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan/HW2_hadoop 2019-10-09 18:43:34,691 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable LVdeMacBook-Pro:bin lvyan\$]</pre>
Rmdir	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls / 2019-10-09 18:46:17,432 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable Found 2 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users drwxrwxrwx - lvyan supergroup 0 2019-10-09 18:33 /testdir [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -rmdir --ignore-fail-on-non-empty /testdir 2019-10-09 18:46:48,065 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls / 2019-10-09 18:46:52,005 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable Found 1 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users LVdeMacBook-Pro:bin lvyan\$]</pre>
Rmr	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -rmr /testdir 2019-10-09 18:53:16,468 WARN util.NativeCodeLoader: Using built-in classes where applicable rmr: DEPRECATED: Please use '-rm -r' instead. Deleted /testdir [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -l / [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls / 2019-10-09 18:54:04,197 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable Found 1 items drwxrwxrwx - lvyan supergroup 0 2019-10-09 00:37 /Users LVdeMacBook-Pro:bin lvyan\$]</pre>
setfacl	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -setfacl -b /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:22:29,258 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using built-in classes where applicable setfacl: The ACL operation has been rejected. Support for ACLs has been disabled by setting dfs.namenode.setfacl.disabled. LVdeMacBook-Pro:bin lvyan\$]</pre>

	 <pre> 17 <!-- Put site-specific property overrides in this file. --> 18 19 <configuration> 20 <property> 21 <name>dfs.namenode.acls.enabled</name> 22 <value>true</value> 23 </property> 24 <property> 25 <name>dfs.replication</name> 26 <value>1</value> 27 </property> 28 <property> 29 <name>dfs.namenode.name.dir</name> 30 <value>file:/usr/local/hadoop/tmp/dfs/name</value> 31 </property> 32 <property> 33 <name>dfs.datanode.data.dir</name> 34 <value>file:/usr/local/hadoop/tmp/dfs/data</value> 35 </property> 36 </configuration> </pre> <p>LVdeMacBook-Pro:bin lvyan\$ hadoop fs -setfacl -b /Users/lvyan/HW2_hadoop/test.csv 2019-10-10 15:37:22,357 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable LVdeMacBook-Pro:bin lvyan\$</p>
Setfattr	<pre> [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -getfattr -d /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:17:43,358 WARN util.NativeCodeLoader: Unable to load native-hadoop libraries where applicable # file: /Users/lvyan/HW2_hadoop/test.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -setfattr -n user.web -v www.google.com /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:19:27,808 WARN util.NativeCodeLoader: Unable to load native-hadoop libraries where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -getfattr -d /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:19:32,657 WARN util.NativeCodeLoader: Unable to load native-hadoop libraries where applicable # file: /Users/lvyan/HW2_hadoop/test.csv user.web="www.google.com" LVdeMacBook-Pro:bin lvyan\$</pre>
Setrep	<pre> ----- ----- [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -stat %r /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:20:47,390 WARN util.NativeCodeLoader: Unable to load native-hadoop libraries where applicable 1 [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -setrep 2 /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:21:01,358 WARN util.NativeCodeLoader: Unable to load native-hadoop libraries where applicable Replication 2 set: /Users/lvyan/HW2_hadoop/test.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -stat %r /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:21:06,495 WARN util.NativeCodeLoader: Unable to load native-hadoop libraries where applicable 2 LVdeMacBook-Pro:bin lvyan\$</pre>

Touch	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -touch /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 21:17:36,493 WARN util.NativeCodeLoader: Unable to load native-hadoop library f sses where applicable LVdeMacBook-Pro:bin lvyan\$]</pre>
Touchz Created an empty file named t1.csv	<pre>-rw-r--r-- 1 lvyan GROUP 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv -rw-r--r-- 1 lvyan GROUP 0 2019-10-09 19:57 /Users/lvyan/HW2_hadoop/t.csv -rw-r--r-- 1 lvyan supergroup 40991122 2019-10-09 19:57 /Users/lvyan/HW2_hadoop/test.csv [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -touchz /Users/lvyan/HW2_hadoop/t1.csv 2019-10-09 19:59:38,406 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... sses where applicable [LVdeMacBook-Pro:bin lvyan\$ hadoop fs -ls /Users/lvyan/HW2_hadoop 2019-10-09 19:59:42,809 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... sses where applicable Found 4 items -rw-r--r-- 1 lvyan GROUP 40990992 2019-10-09 19:08 /Users/lvyan/HW2_hadoop/NYSE_daily_prices_A.csv -rw-r--r-- 1 lvyan GROUP 0 2019-10-09 19:57 /Users/lvyan/HW2_hadoop/t.csv -rw-r--r-- 1 lvyan GROUP 0 2019-10-09 19:59 /Users/lvyan/HW2_hadoop/t1.csv -rw-r--r-- 1 lvyan supergroup 40991122 2019-10-09 19:57 /Users/lvyan/HW2_hadoop/test.csv LVdeMacBook-Pro:bin lvyan\$]</pre>
Truncate Truncate test.csv to size of 100	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -truncate 100 /Users/lvyan/HW2_hadoop/test.csv 2019-10-09 20:12:55,214 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable Truncating /Users/lvyan/HW2_hadoop/test.csv to length: 100. Wait for block recovery to complete before further updating this file. LVdeMacBook-Pro:bin lvyan\$]</pre> <p>File information - test.csv</p> <p>Download Head the file (first 32K) Tail the file (last 32K)</p> <p>Block information -- Block 0</p> <p>Block ID: 1073741831 Block Pool ID: BP-491383355-10.110.39.130-1570130386611 Generation Stamp: 1012 Size: 100 Availability: <ul style="list-style-type: none"> • 10.110.39.130 </p>
usage	<pre>[LVdeMacBook-Pro:bin lvyan\$ hadoop fs -usage test 2019-10-10 15:44:13,321 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable Usage: hadoop fs [generic options] -test -[defswrz] <path> LVdeMacBook-Pro:bin lvyan\$]</pre>