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LAB REPORT on

Big Data Analytics

Submitted by

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in partial fulfillment for the award of the degree of
BACHELOR OF ENGINEERING
in
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CERTIFICATE

This is to certify that the Lab work entitled “Big Data Analytics” carried out by **Jagadeesh A Latti (1BM21CS079)**, who is bonafide student of **B. M. S. College of Engineering**. It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2024. The Lab report has been approved as it satisfies the academic requirements in respect of a **Big Data Analytics- (22CS6PCBDA)** work prescribed for the said degree.

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Course Outcome

CO1	Apply the concepts of NoSQL, Hadoop, Spark for a given task.
CO2	Analyse data analytic techniques for a given problem.
CO3	Conduct experiments using data analytics mechanisms for a given problem.

1. Perform the following DB operations using Cassandra

1. Create a keyspace by name Employee

```
cqlsh:library> CREATE KEYSPACE Employee WITH REPLICATION = { 'class' : 'SimpleStrategy', 'replication_factor' : 1 };
cqlsh:library>
```

2. Create a column family by name Employee-Info with attributes Emp_Id Primary Key, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name

```
cqlsh:employee>
cqlsh:employee> CREATE TABLE Employee_Info (
...     Emp_Id int PRIMARY KEY,
...     Emp_Name text,
...     Designation text,
...     Date_of_Joining date,
...     Salary decimal,
...     Dept_Name text
... );
```

3. Insert the values into the table in batch

```
cqlsh:employee> BEGIN BATCH
... INSERT INTO Employee_Info (Emp_Id, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name)
... VALUES (101, 'John Doe', 'Manager', '2023-01-01', 50000, 'HR');
... INSERT INTO Employee_Info (Emp_Id, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name)
... VALUES (121, 'Jane Smith', 'Developer', '2023-02-01', 60000, 'IT');
... APPLY BATCH;
```

4. Update Employee name and Department of Emp-Id 121

```
cqlsh:employee> UPDATE Employee_Info SET Emp_Name = 'Jane Johnson', Dept_Name = 'Engineering' WHERE Emp_Id = 121;
cqlsh:employee> SELECT * FROM Employee_Info;
```

emp_id	date_of_joining	dept_name	designation	emp_name	salary
121	2023-02-01	Engineering	Developer	Jane Johnson	60000
101	2023-01-01	HR	Manager	John Doe	50000

(2 rows)

5. Sort the details of Employee records based on salary

```
cqlsh:employee> paging off
Disabled Query paging.
cqlsh:employee> SELECT * FROM Employee_Info WHERE Emp_Id IN (121,101) ORDER BY Salary ALLOW FILTERING;
```

emp_id	salary	date_of_joining	dept_name	designation	emp_name
101	50000	2023-01-01	HR	Manager	John Doe
121	60000	2023-02-01	IT	Developer	Jane Smith

(2 rows)

6. Alter the schema of the table Employee_Info to add a column Projects which stores a set of Projects done by the corresponding Employee.

```
cqlsh:employee> UPDATE Employee_Info SET Projects = {'ProjectA', 'ProjectB'} WHERE Emp_Id = 101 and salary=50000;
cqlsh:employee> UPDATE Employee_Info SET Projects = {'ProjectC'} WHERE Emp_Id = 121 and salary=60000;
cqlsh:employee> select * from Employee_Info;
```

emp_id	salary	date_of_joining	dept_name	designation	emp_name	projects
121	60000	2023-02-01	IT	Developer	Jane Smith	{'ProjectC'}
101	50000	2023-01-01	HR	Manager	John Doe	{'ProjectA', 'ProjectB'}

(2 rows)

7. Update the altered table to add project names.

```
cqlsh:employee> UPDATE Employee_Info SET Projects = {'ProjectA', 'ProjectB'} WHERE Emp_Id = 101 and salary=50000;
cqlsh:employee> UPDATE Employee_Info SET Projects = {'ProjectC'} WHERE Emp_Id = 121 and salary=60000;
cqlsh:employee> select * from Employee_Info;
```

emp_id	salary	date_of_joining	dept_name	designation	emp_name	projects
121	60000	2023-02-01	IT	Developer	Jane Smith	{'ProjectC'}
101	50000	2023-01-01	HR	Manager	John Doe	{'ProjectA', 'ProjectB'}

(2 rows)

8. Create a TTL of 15 seconds to display the values of Employees.

```
cqlsh:employee> INSERT INTO Employee_Info (Emp_Id, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name) VALUES (102, 'Jane Smith', 'Developer', '2022-06-03', 60000, 'IT') USING TTL 15;
cqlsh:employee> select ttl(Emp_Name) from Employee_Info where Emp_id=102;
```

ttl(emp_name)
14

(1 rows)

2. Perform the following DB operations using Cassandra.

1. Create a keyspace by name Library

```
cqlsh> CREATE KEYSPACE Library WITH REPLICATION = { 'class' : 'SimpleStrategy', 'replication_factor' : 1 };
cqlsh> show keyspaces;
Improper show command.
cqlsh> use Library;
cqlsh:library> |
```

2. Create a column family by name Library-Info with attributes

Stud_Id Primary Key, Counter_value of type Counter,

Stud_Name, Book-Name, Book-Id, Date_of_issue

```
cqlsh:library> CREATE TABLE Library_Info (Stud_Id int PRIMARY KEY, Counter_value counter, Stud_Name text, Book_Name text, Book_Id text, Date_of_issue timestamp);
InvalidRequest: Error from server: code=2200 [Invalid query] message="Cannot mix counter and non counter columns in the same table"
cqlsh:library> CREATE TABLE Library_Info (
...     Stud_Id int PRIMARY KEY,
...     Stud_Name text,
...     Book_Name text,
...     Book_Id text,
...     Date_of_issue timestamp
... );
cqlsh:library> CREATE TABLE Library_Counters (
...     Stud_Id int PRIMARY KEY,
...     Counter_value counter
... );
cqlsh:library>
```

3. Insert the values into the table in batch

```
cqlsh:library> BEGIN BATCH
... INSERT INTO Library_Info (Stud_Id, Stud_Name, Book_Name, Book_Id, Date_of_issue) VALUES (112, 'John Doe', 'BDA', 'B001', '2023-01-01');
... INSERT INTO Library_Info (Stud_Id, Stud_Name, Book_Name, Book_Id, Date_of_issue) VALUES (113, 'Jane Smith', 'ML', 'B002', '2023-01-02');
... APPLY BATCH;
```

4. Display the details of the table created and increase the value of the counter

```
cqlsh:library> SELECT * FROM Library_Info;

stud_id | book_id | book_name | date_of_issue | stud_name
-----+-----+-----+-----+-----
113     | B002    | ML        | 2023-01-02 00:00:00.000000+0000 | Jane Smith
112     | B001    | BDA       | 2023-01-01 00:00:00.000000+0000 | John Doe
(2 rows)
cqlsh:library> SELECT * FROM Library_Counters;

stud_id | counter_value
-----+-----
113     | 1
112     | 1
(2 rows)
```

5. Write a query to show that a student with id 112 has taken a book “BDA” 2 times.

```
cqlsh:library> UPDATE Library_Counters SET Counter_value = Counter_value + 1 WHERE Stud_Id = 112;
cqlsh:library> SELECT * FROM Library_Counters WHERE Stud_Id = 112;

stud_id | counter_value
-----+-----
112     | 2
(1 rows)
```

6. Export the created column to a csv file

```
cqlsh:library> COPY Library_Info (Stud_Id, Stud_Name, Book_Name, Book_Id, Date_of_issue) TO 'file.csv' WITH HEADER = TRUE;
Using 11 child processes

Starting copy of library.library_info with columns [stud_id, stud_name, book_name, book_id, date_of_issue].
Processed: 2 rows; Rate:      10 rows/s; Avg. rate:      6 rows/s
2 rows exported to 1 files in 0.374 seconds.
cqlsh:library> COPY Library_Counters (Stud_Id, Counter_value) FROM 'library_counters.csv' WITH HEADER = TRUE;
Using 11 child processes
```

7. Import a given csv dataset from local file system into Cassandra column family

```
cqlsh:library> copy library_info(Stud_Id,Stud_Name,Book_Name,Book_Id,Date_of_issue) from 'file.csv' with header=true;
Using 7 child processes

Starting copy of library.library_info with columns [stud_id, stud_name, book_name, book_id, date_of_issue].
Processed: 2 rows; Rate:      2 rows/s; Avg. rate:      4 rows/s
2 rows imported from 1 files in 0.513 seconds (0 skipped).
cqlsh:library> select * from library_info;
```

stud_id	book_id	book_name	date_of_issue	stud_name
113	B002	ML	2023-01-02 00:00:00.000000+0000	Jane Smith
112	B001	BDA	2023-01-01 00:00:00.000000+0000	John Doe

3. MongoDB- CRUD Demonstration

I. Perform the following DB operations using MongoDB.

1. Create a database “Student” with the following attributes Rollno, Age, ContactNo, Email- Id.

> use StudentDB

2. Insert appropriate values

> db.students.insertMany([

{ Rollno: 1, Age: 20, ContactNo: "1234567890", EmailId: "student1@example.com" },

{ Rollno: 2, Age: 21, ContactNo: "1234567891", EmailId: "student2@example.com" },

{ Rollno: 10, Age: 22, ContactNo: "1234567892", EmailId: "student10@example.com" },

{ Rollno: 11, Age: 23, ContactNo: "1234567893", EmailId: "student11@example.com", Name: "ABC" }

])

3. Write query to update Email-Id of a student with rollno 10.

> db.students.updateOne(

{ Rollno: 10 },

{ \$set: { EmailId: "newemail10@example.com" } }

)

4. Replace the student’s name from “ABC” to “FEM” of rollno 11

> db.students.updateOne(

{ Rollno: 11, Name: "ABC" },

{ \$set: { Name: "FEM" } }

)


```

mongosh mongodb+srv://<credentials>@cluster0g2l1piv.mongodb.net/
Atlas atlas-vf2sb5-shard-0 [primary] test> use StudentDB
switched to db StudentDB
Atlas atlas-vf2sb5-shard-0 [primary] StudentDB> db.students.insertMany([ { Rollno: 1, Age: 20, ContactNo: "1234567890", Email: atlas-vf2sb5-shard-0 [primary] StudentDB> db.students.insertMany([ { Rollno: 1, Age: 20, ContactNo: "1234567890", EmailId: "student1@example.com" }, { Rollno: 2, Age: 21, ContactNo: "1234567891", EmailId: "student2@example.com" }, { Rollno: 10, Age: 22, ContactNo: "1234567892", EmailId: "student10@example.com" }, { Rollno: 11, Age: 23, ContactNo: "1234567893", EmailId: "student11@example.com", Name: "ABC" } ])
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId("665cb292bbd9bf2f0a39a10"),
    '1': ObjectId("665cb292bbd9bf2f0a39a11"),
    '2': ObjectId("665cb292bbd9bf2f0a39a12"),
    '3': ObjectId("665cb292bbd9bf2f0a39a13")
  }
}
Atlas atlas-vf2sb5-shard-0 [primary] StudentDB> db.students.updateOne({ Rollno: 10 }, { $set: { EmailId: "newemail10@example.com" } })
{
  acknowledged: true,
  insertedId: null,
  modifiedCount: 1,
  upsertedCount: 0
}
Atlas atlas-vf2sb5-shard-0 [primary] StudentDB> db.students.find({ Rollno: 10 })
{
  _id: ObjectId("665cb292bbd9bf2f0a39a12"),
  Rollno: 10,
  Age: 22,
  ContactNo: "1234567892",
  EmailId: "newemail10@example.com"
}
Atlas atlas-vf2sb5-shard-0 [primary] StudentDB>
Atlas atlas-vf2sb5-shard-0 [primary] StudentDB> db.students.updateOne({ Rollno: 11, Name: "ABC" }, { $set: { Name: "FER" } })
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
Atlas atlas-vf2sb5-shard-0 [primary] StudentDB> db.students.find({ Rollno: 11 })
{
  _id: ObjectId("665cb292bbd9bf2f0a39a13"),
  Rollno: 11,
  Age: 23,
  ContactNo: "1234567893",
  EmailId: "student11@example.com",
  Name: "FER"
}

```

II. Perform the following DB operations using MongoDB.

1. Create a collection by name Customers with the following attributes. Cust_id, Acc_Bal, use Bank;

```

db.Customers.insertOne({
  Cust_id: 1,
  Acc_Bal: 1000,
  Acc_Type: "A"
});

```

2. Insert at least 5 values into the table

> use CustomerDB

```

db.customers.insertMany([
  { Cust_id: 1, Acc_Bal: 1500, Acc_Type: 'Z' },
  { Cust_id: 2, Acc_Bal: 800, Acc_Type: 'Y' },
  { Cust_id: 3, Acc_Bal: 2000, Acc_Type: 'Z' },
  { Cust_id: 4, Acc_Bal: 1000, Acc_Type: 'X' },
  { Cust_id: 5, Acc_Bal: 1300, Acc_Type: 'Z' }
])

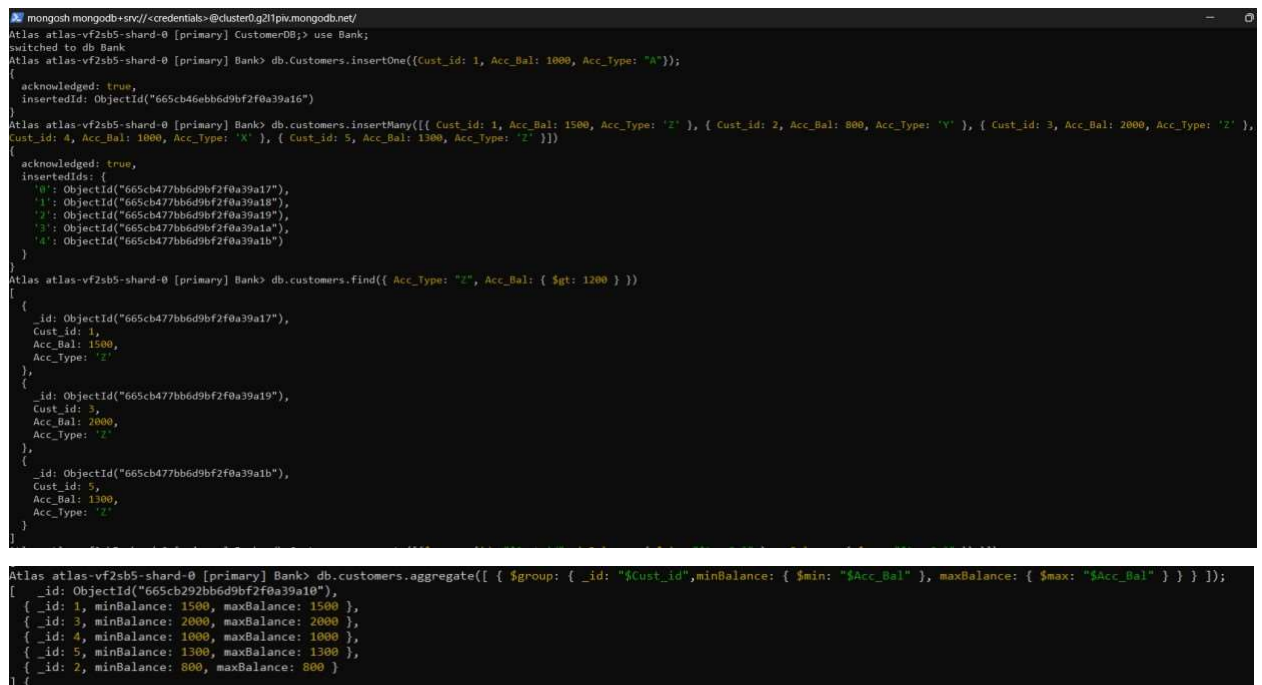
```

3. Write a query to display those records whose total account balance is greater than 1200 of account type 'Z' for each customer_id.

```
db.Customers.find({ Acc_Type:
    "Z", Acc_Bal: { $gt: 1200 }
});
```

4. Determine Minimum and Maximum account balance for each customer_i

```
db.Customers.aggregate([
    {
        $group: {
            _id: "$Cust_id",
            minBalance: { $min: "$Acc_Bal" },
            maxBalance: { $max: "$Acc_Bal" }
        }
    }
]);
```



The screenshot shows a MongoDB terminal window with the following content:

```
mongosh mongodb+srv://<credentials>@cluster0.g21piv.mongodb.net/
Atlas atlas-vf2sb5-shard-0 [primary] CustomerDB; use Bank;
switched to db Bank
Atlas atlas-vf2sb5-shard-0 [primary] Bank> db.Customers.insertOne({Cust_id: 1, Acc_Bal: 1000, Acc_Type: "A"});
{
  acknowledged: true,
  insertedId: ObjectId("665cb46ebb6d9bf2f0a39a16")
}
Atlas atlas-vf2sb5-shard-0 [primary] Bank> db.customers.insertMany([
  { Cust_id: 1, Acc_Bal: 1500, Acc_Type: "Z" },
  { Cust_id: 2, Acc_Bal: 800, Acc_Type: "Y" },
  { Cust_id: 3, Acc_Bal: 2000, Acc_Type: "Z" },
  { Cust_id: 4, Acc_Bal: 1000, Acc_Type: "X" },
  { Cust_id: 5, Acc_Bal: 1300, Acc_Type: "Z" }
]);
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId("665cb477bb6d9bf2f0a39a17"),
    '1': ObjectId("665cb477bb6d9bf2f0a39a18"),
    '2': ObjectId("665cb477bb6d9bf2f0a39a19"),
    '3': ObjectId("665cb477bb6d9bf2f0a39a1a"),
    '4': ObjectId("665cb477bb6d9bf2f0a39a1b")
  }
}
Atlas atlas-vf2sb5-shard-0 [primary] Bank> db.customers.find({ Acc_Type: "Z", Acc_Bal: { $gt: 1200 } })
[
  {
    _id: ObjectId("665cb477bb6d9bf2f0a39a17"),
    Cust_id: 1,
    Acc_Bal: 1500,
    Acc_Type: "Z"
  },
  {
    _id: ObjectId("665cb477bb6d9bf2f0a39a19"),
    Cust_id: 3,
    Acc_Bal: 2000,
    Acc_Type: "Z"
  },
  {
    _id: ObjectId("665cb477bb6d9bf2f0a39a1b"),
    Cust_id: 5,
    Acc_Bal: 1300,
    Acc_Type: "Z"
  }
]
Atlas atlas-vf2sb5-shard-0 [primary] Bank> db.customers.aggregate([
  { $group: { _id: "$Cust_id", minBalance: { $min: "$Acc_Bal" }, maxBalance: { $max: "$Acc_Bal" } } }
]);
[
  {
    _id: ObjectId("665cb292bb6d9bf2f0a39a10"),
    {
      _id: 1, minBalance: 1500, maxBalance: 1500
    },
    {
      _id: 3, minBalance: 2000, maxBalance: 2000
    },
    {
      _id: 4, minBalance: 1000, maxBalance: 1000
    },
    {
      _id: 5, minBalance: 1300, maxBalance: 1300
    },
    {
      _id: 2, minBalance: 800, maxBalance: 800
    }
  ]
]
```

4. Screenshot of Hadoop installed

```
Command Prompt
Microsoft Windows [Version 10.0.17134.648]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\hp>hadoop version
Hadoop 3.1.0
Source code repository: https://github.com/apache/hadoop - r.16b70610a74c4c4f5d3b05c54b58c377239cbe6d
```

5. Execution of HDFS Commands for interaction with Hadoop Environment. (Minimum 10 commands to be executed)

1. mkdir
2. ls

```
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as hadoop in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
Starting datanodes
Starting secondary namenodes [bmscscse-HP-Elite-Tower-800-G9-Desktop-PC]
Starting resourcemanager
Starting nodemanagers
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -mkdir /bda_hadoop
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -ls /
Found 1 items
drwxr-xr-x - hadoop supergroup 0 2024-05-13 14:37 /bda_hadoop
```

3. put

```
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -put /home/hadoop/Desktop/bda_local.txt /bda_hadoop/file.txt
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -ls /bda_hadoop
Found 1 items
-rw-r--r-- 1 hadoop supergroup 9 2024-05-13 14:42 /bda_hadoop/file.txt
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -cat /bda_hadoop/file.txt
Hello!!!
```

4. copyFromLocal

```
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -copyFromLocal /home/hadoop/Desktop/bda_local.txt /bda_hadoop/file_cp_local.txt
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -cat /bda_hadoop/file_cp_local.txt
Hello!!!
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$
```

5. get

```
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -get /bda_hadoop/file.txt /home/hadoop/Desktop/downloaded_file.txt
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -getmerge /bda_hadoop/file.txt /bda_hadoop/file_cp_local.txt /home/hadoop/Desktop/downloaded_file.txt
hadoop@bmscscse-HP-Elite-Tower-800-G9-Desktop-PC:~$
```

```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -getfacl /bda_hadoop/
# file: /bda_hadoop
# owner: hadoop
# group: supergroup
user::rwx
group::r-x
other::r-x
```

6. copyToLocal

```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -copyToLocal /bda_hadoop/file.txt /home/hadoop/Desktop
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -mv /bda_hadoop /abc
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /abc
Found 2 items
-rw-r--r-- 1 hadoop supergroup          9 2024-05-13 14:42 /abc/file.txt
-rw-r--r-- 1 hadoop supergroup          9 2024-05-13 14:52 /abc/file_cp_local.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -cp /hello/ /hadoop_lab
cp: '/hello/': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$
```

7. cat

```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -cat /bda_hadoop/file_cp_local.txt
Hello!!!
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$
```

8. mv

```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -mv /bda_hadoop /abc
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /abc
Found 2 items
-rw-r--r-- 1 hadoop supergroup          9 2024-05-13 14:42 /abc/file.txt
-rw-r--r-- 1 hadoop supergroup          9 2024-05-13 14:52 /abc/file_cp_local.txt
```

9. cp

```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -cp /hello/ /hadoop_lab
cp: '/hello/': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$
```

6. Implement WordCount Program on Hadoop framework

Mapper Code:

```
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapred.MapReduceBase;
import org.apache.hadoop.mapred.Mapper;
import org.apache.hadoop.mapred.OutputCollector;
import org.apache.hadoop.mapred.Reporter;
public class WCMapper extends MapReduceBase implements Mapper<LongWritable,
Text, Text,
IntWritable> {
public void map(LongWritable key, Text value, OutputCollector<Text,
IntWritable> output, Reporter rep) throws IOException
{
String line = value.toString(); for
(String word : line.split(" "))
{
if (word.length() > 0)
{
output.collect(new Text(word), new IntWritable(1));
} } } }
```

Reducer Code:

```
// Importing libraries
import java.io.IOException;
import java.util.Iterator;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
```

```

import org.apache.hadoop.mapred.MapReduceBase;
import org.apache.hadoop.mapred.OutputCollector;
import org.apache.hadoop.mapred.Reducer;
import org.apache.hadoop.mapred.Reporter;
public class WCReducer extends MapReduceBase implements Reducer<Text,
IntWritable, Text, IntWritable> {
// Reduce function
public void reduce(Text key, Iterator<IntWritable> value,
OutputCollector<Text, IntWritable> output,
Reporter rep) throws IOException
{
int count = 0;
// Counting the frequency of each words
while (value.hasNext())
{
IntWritable i = value.next();
count += i.get();
}
output.collect(key, new IntWritable(count));
} }

```

Driver Code: You have to copy paste this program into the WCDriver Java Class file.

```

// Importing libraries
import java.io.IOException;
import org.apache.hadoop.conf.Configured;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapred.FileInputFormat;
import org.apache.hadoop.mapred.FileOutputFormat;
import org.apache.hadoop.mapred.JobClient;
import org.apache.hadoop.mapred.JobConf;

```

```

import org.apache.hadoop.util.Tool;
import org.apache.hadoop.util.ToolRunner;
public class WCDriver extends Configured implements Tool { public int
run(String args[]) throws IOException
{
if (args.length < 2)
{
System.out.println("Please give valid inputs"); return -
1;
}
JobConf conf = new JobConf(WCDriver.class);
FileInputFormat.setInputPaths(conf, new Path(args[0]));
FileOutputFormat.setOutputPath(conf, new Path(args[1]));
conf.setMapperClass(WCMapper.class);
conf.setReducerClass(WCReducer.class);
conf.setMapOutputKeyClass(Text.class);
conf.setMapOutputValueClass(IntWritable.class);
conf.setOutputKeyClass(Text.class);
conf.setOutputValueClass(IntWritable.class); JobClient.runJob(conf);
return 0;
}
// Main Method
public static void main(String args[]) throws Exception
{
int exitCode = ToolRunner.run(new WCDriver(), args); System.out.println(exitCode);
}
}
OUTPUT

```

```

2021-04-24 14:55:13,844 INFO common.Storage: Storage directory C:\hadoop-3.3.0\data\namenode has been successfully formatted.
2021-04-24 14:55:13,895 INFO namenode.FSImageFormatProtobuf: Saving image file C:\hadoop-3.3.0\data\namenode\current\fsimage.ckpt_00000000000000000000 using no compression
2021-04-24 14:55:14,002 INFO namenode.FSImageFormatProtobuf: Image file C:\hadoop-3.3.0\data\namenode\current\fsimage.ckpt_00000000000000000000 of size 402 bytes saved in 0 seconds .
2021-04-24 14:55:14,115 INFO namenode.NNStorageRetentionManager: Going to retain 1 images with txid >= 0
2021-04-24 14:55:14,121 INFO namenode.FSImage: FSImageSaver clean checkpoint: txid=0 when meet shutdown.
2021-04-24 14:55:14,121 INFO namenode.NameNode: SHUTDOWN_MSG:
/*****
SHUTDOWN_MSG: Shutting down NameNode at LAPTOP-JG329ESD/192.168.56.1
*****/

C:\hadoop-3.3.0\sbin>start-dfs

C:\hadoop-3.3.0\sbin>start-yarn
starting yarn daemons

C:\hadoop-3.3.0\sbin>jps
12276 NameNode
14776 DataNode
15512 NodeManager
1800 Jps
6764 ResourceManager

C:\hadoop-3.3.0\sbin>hdfs dfs -mkdir /input_dir

C:\hadoop-3.3.0\sbin>hdfs dfs -ls /
Found 1 items
drwxr-xr-x - Anusree supergroup 0 2021-04-24 14:56 /input_dir

C:\hadoop-3.3.0\sbin>hdfs dfs -copyFromLocal C:\input_file.txt /input_dir

```



```

C:\hadoop-3.3.0\sbin>hdfs dfs -cat /input_dir/input_file.txt
Hello World
Hello Hadoop
This is Hadoop test file
C:\hadoop-3.3.0\sbin>hadoop jar C:\MapReduceClient.jar wordcount /input_dir /output_dir
2021-04-24 15:24:57,242 INFO client.DefaultNoHARMFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2021-04-24 15:24:57,714 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/staging/Anusree/.staging/job_1619256355508_0002
2021-04-24 15:24:58,387 INFO input.FileInputFormat: Total input files to process : 1
2021-04-24 15:24:58,809 INFO mapreduce.JobSubmitter: number of splits:1
2021-04-24 15:24:59,255 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1619256355508_0002
2021-04-24 15:24:59,255 INFO mapreduce.JobSubmitter: Executing with tokens: []
2021-04-24 15:24:59,450 INFO conf.Configuration: resource-types.xml not found
2021-04-24 15:24:59,451 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2021-04-24 15:24:59,533 INFO impl.YarnClientImpl: Submitted application application_1619256355508_0002
2021-04-24 15:24:59,581 INFO mapreduce.Job: The url to track the job: http://LAPTOP-JG329ESD:8088/proxy/application_1619256355508_0002/
2021-04-24 15:24:59,582 INFO mapreduce.Job: Running job: job_1619256355508_0002
2021-04-24 15:25:12,857 INFO mapreduce.Job: Job job_1619256355508_0002 running in uber mode : false
2021-04-24 15:25:12,861 INFO mapreduce.Job: map 0% reduce 0%
2021-04-24 15:25:19,985 INFO mapreduce.Job: map 100% reduce 0%
2021-04-24 15:25:26,077 INFO mapreduce.Job: map 100% reduce 100%
2021-04-24 15:25:32,181 INFO mapreduce.Job: Job job_1619256355508_0002 completed successfully
2021-04-24 15:25:32,284 INFO mapreduce.Job: Counters: 54
    File System Counters
        FILE: Number of bytes read=85
        FILE: Number of bytes written=530945
        FILE: Number of read operations=0
        FILE: Number of large read operations=0
        FILE: Number of write operations=0
        HDFS: Number of bytes read=162
        HDFS: Number of bytes written=51

```

```

C:\hadoop-3.3.0\sbin>hdfs dfs -cat /output_dir/*
Hadoop 2
Hello 2
This 1
World 1
file 1
is 1
test 1

C:\hadoop-3.3.0\sbin>

```

7. From the following link extract the weather data
[https://github.com/tomwhite/hadoop-](https://github.com/tomwhite/hadoop-Book/tree/master/input/ncdc/all)

Book/tree/master/input/ncdc/all
Create a Map Reduce program to

a) find average temperature for each year from NCDC data set.

AverageDriver

```
package temp;

import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;
public class AverageDriver {
    public static void main(String[] args) throws Exception
    { if (args.length != 2) {
        System.err.println("Please Enter the input and output parameters");
        System.exit(-1);
    }
    Job job = new Job();
    job.setJarByClass(AverageDriver.class);
    job.setJobName("Max temperature");
    FileInputFormat.addInputPath(job, new Path(args[0]));
    FileOutputFormat.setOutputPath(job, new Path(args[1]));
    job.setMapperClass(AverageMapper.class);
    job.setReducerClass(AverageReducer.class);
    job.setOutputKeyClass(Text.class);
    job.setOutputValueClass(IntWritable.class);
    System.exit(job.waitForCompletion(true) ? 0 : 1);
    }
}
```

AverageMapper

```
package temp;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Mapper;
public class AverageMapper extends Mapper<LongWritable, Text, Text, IntWritable>
{ public static final int MISSING = 9999;
```

```

public void map(LongWritable key, Text value, Mapper<LongWritable, Text, Text,
IntWritable> context) throws IOException, InterruptedException {
    int temperature;
    String line = value.toString();
    String year = line.substring(15, 19);
    if (line.charAt(87) == '+') {
        temperature = Integer.parseInt(line.substring(88, 92));
    } else {
        temperature = Integer.parseInt(line.substring(87, 92));
    }
    String quality = line.substring(92, 93);
    if (temperature != 9999 && quality.matches("[01459]"))
        context.write(new Text(year), new IntWritable(temperature));
}
}

```

AverageReducer

```

package temp;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;

import org.apache.hadoop.mapreduce.Reducer;
public class AverageReducer extends Reducer<Text, IntWritable, Text, IntWritable>
{ public void reduce(Text key, Iterable<IntWritable> values, Reducer<Text,
IntWritable, Text, IntWritable> context) throws IOException, InterruptedException
{
    int max_temp = 0;
    int count = 0;
    for (IntWritable value : values)
    { max_temp += value.get();
      count++;
    }
    context.write(key, new IntWritable(max_temp / count));
}
}

```

OUTPUT

```

C:\hadoop-3.3.0\sbin>hadoop jar C:\avgtemp.jar temp.AverageDriver /input_dir/temp.txt /avgtemp_outputdir
2021-05-15 14:52:50,635 INFO client.DefaultHadoopFollowerProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2021-05-15 14:52:51,005 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
2021-05-15 14:52:51,111 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/staging/Anusree/.staging/job_1621060230696_0005
2021-05-15 14:52:51,735 INFO input.FileInputFormat: Total input files to process : 1
2021-05-15 14:52:52,751 INFO mapreduce.JobSubmitter: number of splits:1
2021-05-15 14:52:53,073 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1621060230696_0005
2021-05-15 14:52:53,073 INFO mapreduce.JobSubmitter: Executing with tokens: []
2021-05-15 14:52:53,237 INFO conf.Configuration: resource-types.xml not found
2021-05-15 14:52:53,238 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2021-05-15 14:52:53,312 INFO impl.YarnClientImpl: Submitted application application_1621060230696_0005
2021-05-15 14:52:53,352 INFO mapreduce.Job: The url to track the job: http://LAPTOP-76329ESD:8088/proxy/application_1621060230696_0005/
2021-05-15 14:52:53,353 INFO mapreduce.Job: Running job: job_1621060230696_0005
2021-05-15 14:53:06,640 INFO mapreduce.Job: Job job_1621060230696_0005 running in uber mode : false
2021-05-15 14:53:06,643 INFO mapreduce.Job:  map 0% reduce 0%
2021-05-15 14:53:12,758 INFO mapreduce.Job:  map 100% reduce 0%
2021-05-15 14:53:19,060 INFO mapreduce.Job:  map 100% reduce 100%
2021-05-15 14:53:25,967 INFO mapreduce.Job: Job job_1621060230696_0005 completed successfully
2021-05-15 14:53:26,096 INFO mapreduce.Job: Counters: 54
    File System Counters
        FILE: Number of bytes read=72210
        FILE: Number of bytes written=674341
        FILE: Number of read operations=0
        FILE: Number of large read operations=0
        FILE: Number of write operations=0
        HDFS: Number of bytes read=894860
        HDFS: Number of bytes written=8
        HDFS: Number of read operations=0
        HDFS: Number of large read operations=0
        HDFS: Number of write operations=2
        HDFS: Number of bytes read erasure-coded=0
    Job Counters
        Launched map tasks=1
        Launched reduce tasks=1
        Data-local map tasks=1
        Total time spent by all maps in occupied slots (ms)=3782

```

```

C:\hadoop-3.3.0\sbin>hdfs dfs -ls /avgtemp_outputdir
Found 2 items
-rw-r--r-- 1 Anusree supergroup          0 2021-05-15 14:53 /avgtemp_outputdir/_SUCCESS
-rw-r--r-- 1 Anusree supergroup          8 2021-05-15 14:53 /avgtemp_outputdir/part-r-000000

C:\hadoop-3.3.0\sbin>hdfs dfs -cat /avgtemp_outputdir/part-r-000000
1901    46

C:\hadoop-3.3.0\sbin>

```

b) find the mean max temperature for every month

MeanMaxDriver.class

```

package meanmax;

import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;

public class MeanMaxDriver {

    public static void main(String[] args) throws Exception
    { if (args.length != 2) {

```

```

System.err.println("Please Enter the input and output parameters");
System.exit(-1);
}
Job job = new Job();
job.setJarByClass(MeanMaxDriver.class);
job.setJobName("Max temperature");
FileInputFormat.addInputPath(job, new Path(args[0]));
FileOutputFormat.setOutputPath(job, new Path(args[1]));
job.setMapperClass(MeanMaxMapper.class);
job.setReducerClass(MeanMaxReducer.class);
job.setOutputKeyClass(Text.class);
job.setOutputValueClass(IntWritable.class);
System.exit(job.waitForCompletion(true) ? 0 : 1);
}
}

```

MeanMaxMapper.class

```

package meanmax;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Mapper;
public class MeanMaxMapper extends Mapper<LongWritable, Text, Text, IntWritable> {
    public static final int MISSING = 9999;
    public void map(LongWritable key, Text value, Mapper<LongWritable, Text, Text,
    IntWritable>.Context context) throws IOException, InterruptedException {
        int temperature;
        String line = value.toString();
        String month = line.substring(19, 21);
        if (line.charAt(87) == '+') {
            temperature = Integer.parseInt(line.substring(88, 92));
        } else {
            temperature = Integer.parseInt(line.substring(87, 92));
        }
        String quality = line.substring(92, 93);
        if (temperature != 9999 && quality.matches("[01459]"))
            context.write(new Text(month), new IntWritable(temperature));
        }
    }
}

```

MeanMaxReducer.class

```

package meanmax;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Reducer;
public class MeanMaxReducer extends Reducer<Text, IntWritable, Text, IntWritable>
{ public void reduce(Text key, Iterable<IntWritable> values, Reducer<Text,
IntWritable, Text, IntWritable>, Context context) throws IOException, InterruptedException
{
int max_temp = 0;
int total_temp = 0;
int count = 0;
int days = 0;
for (IntWritable value : values)
{ int temp = value.get();
if (temp > max_temp)
max_temp = temp;
count++;
if (count == 3)
{ total_temp += max_temp;
max_temp = 0;
count = 0;
days++;
}
}
context.write(key, new IntWritable(total_temp / days));
}
}

```

OUTPUT:

```

C:\hadoop-3.3.0\sbin>hadoop jar C:\meanmax.jar meanmax.MeanMaxDriver /input_dir/tmp.txt /meanmax_output
2021-05-21 20:28:05,250 INFO client.DefaultHadoopFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2021-05-21 20:28:05,562 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
2021-05-21 20:28:06,916 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/staging/krusree/.staging/job_1621608943095_0001
2021-05-21 20:28:08,426 INFO input.FileInputFormat: Total input files to process : 1
2021-05-21 20:28:09,107 INFO mapreduce.JobSubmitter: number of splits:1
2021-05-21 20:28:09,741 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1621608943095_0001
2021-05-21 20:28:09,741 INFO mapreduce.JobSubmitter: Executing with tokens: []
2021-05-21 20:28:10,029 INFO conf.Configuration: resource-types.xml not found
2021-05-21 20:28:10,030 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2021-05-21 20:28:10,676 INFO impl.YarnClientImpl: Submitted application application_1621608943095_0001
2021-05-21 20:28:11,005 INFO mapreduce.Job: The url to track the job: http://LAPTOP-JG329E50:8080/proxy/application_1621608943095_0001/
2021-05-21 20:28:11,006 INFO mapreduce.Job: Running job: job_1621608943095_0001
2021-05-21 20:28:29,385 INFO mapreduce.Job: Job job_1621608943095_0001 running in uber mode : false
2021-05-21 20:28:29,389 INFO mapreduce.Job:  map 0% reduce 0%
2021-05-21 20:28:40,664 INFO mapreduce.Job:  map 100% reduce 0%
2021-05-21 20:28:50,812 INFO mapreduce.Job:  map 100% reduce 100%
2021-05-21 20:28:50,965 INFO mapreduce.Job: Job job_1621608943095_0001 completed successfully
2021-05-21 20:28:59,178 INFO mapreduce.Job: Counters: 54
  File System Counters
    FILE: Number of bytes read=59002
    FILE: Number of bytes written=649901
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=891050
    HDFS: Number of bytes written=74
    HDFS: Number of read operations=8
    HDFS: Number of large read operations=0
    HDFS: Number of write operations=2
    HDFS: Number of bytes read erasure-coded=0
  Job Counters
    Launched map tasks=1
    Launched reduce tasks=4
    Data-local map tasks=1
    Total time spent by all maps in occupied slots (ms)=8077
    Total time spent by all reduces in occupied slots (ms)=7511
    Total time spent by all map tasks (ms)=8077
    Total time spent by all reduce tasks (ms)=7511
    Total vcore-millisecods taken by all map tasks=8077
    Total vcore-millisecods taken by all reduce tasks=7511
    Total megabyte-millisecods taken by all map tasks=8270848
    Total megabyte-millisecods taken by all reduce tasks=7691264

```

```

C:\hadoop-3.3.0\sbin>hdfs dfs -cat /meanmax_output/*

```

```

01      4
02      0
03      7
04     44
05    100
06    168
07    219
08    198
09    141
10    100
11     19
12      3

```

```

C:\hadoop-3.3.0\sbin>

```

8. For a given Text file, Create a Map Reduce program to sort the content in an alphabetic order listing only top 10 maximum occurrences of words.

```
package samples.topn;
import java.io.IOException;
import java.util.StringTokenizer;
import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.Mapper;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;
import org.apache.hadoop.util.GenericOptionsParser;
public class TopN {
    public static void main(String[] args) throws Exception
    { Configuration conf = new Configuration();
    String[] otherArgs = (new GenericOptionsParser(conf, args)).getRemainingArgs();
    if (otherArgs.length != 2) {
        System.err.println("Usage: TopN <in><out>");
        System.exit(2);
    }
    Job job = Job.getInstance(conf);
    job.setJobName("Top N");
    job.setJarByClass(TopN.class);
    job.setMapperClass(TopNMapper.class);
    job.setReducerClass(TopNReducer.class);
    job.setOutputKeyClass(Text.class);
    job.setOutputValueClass(IntWritable.class);
    FileInputFormat.addInputPath(job, new Path(otherArgs[0]));
    FileOutputFormat.setOutputPath(job, new Path(otherArgs[1]));
    System.exit(job.waitForCompletion(true) ? 0 : 1);
    }
    public static class TopNMapper extends Mapper<Object, Text, Text, IntWritable>
    { private static final IntWritable one = new IntWritable(1);
    private Text word = new Text();
    private String tokens = "[_!$#<>\\^=\\[\\]\\|\\*\\/\\\\\\\\\\,;,.\\-_:()?!\\'\""]
    public void map(Object key, Text value, Mapper<Object, Text, Text, IntWritable>.Context context)
    throws IOException, InterruptedException {
        String cleanLine = value.toString().toLowerCase().replaceAll(this.tokens, "&quot; &quot;");
        StringTokenizer itr = new StringTokenizer(cleanLine);
        while (itr.hasMoreTokens()) {
```



```

this.word.set(itr.nextToken().trim());
context.write(this.word, one);
}

```

```

}
}
}

```

TopNCombiner.class

```

package samples.topn;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Reducer;
public class TopNCombiner extends Reducer<Text, IntWritable, Text, IntWritable>
{ public void reduce(Text key, Iterable<IntWritable> values, Reducer<Text,
IntWritable, Text, IntWritable>.Context context) throws IOException, InterruptedException
{
int sum = 0;
for (IntWritable val : values)
sum += val.get();
context.write(key, new IntWritable(sum));
}
}

```

TopNMapper.class

```

package samples.topn;
import java.io.IOException;
import java.util.StringTokenizer;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Mapper;
public class TopNMapper extends Mapper<Object, Text, Text, IntWritable>
{ private static final IntWritable one = new IntWritable(1);
private Text word = new Text();
private String tokens = "[_!$#<>\\^`=\\[\\]\\*\\/\\\\\\\\,;,.\\-:()?!\"'"]
public void map(Object key, Text value, Mapper<Object, Text, Text, IntWritable>.Context context)
throws IOException, InterruptedException {
String cleanLine = value.toString().toLowerCase().replaceAll(this.tokens, "&quot; &quot;");
StringTokenizer itr = new StringTokenizer(cleanLine);
while (itr.hasMoreTokens())
{ this.word.set(itr.nextToken().trim());
context.write(this.word, one);
}
}
}

```

```
}
```

```
TopNReducer.class
```

```
package samples.topn;
```

```
import java.io.IOException;
```

```
import java.util.HashMap;
```

```
import java.util.Map;
```

```
import org.apache.hadoop.io.IntWritable;
```

```
import org.apache.hadoop.io.Text;
```

```
import org.apache.hadoop.mapreduce.Reducer;
```

```
import utils.MiscUtils;
```

```
public class TopNReducer extends Reducer<Text, IntWritable, Text, IntWritable>
```

```
{ private Map<Text, IntWritable> countMap = new HashMap<>();
```

```
public void reduce(Text key, Iterable<IntWritable> values, Reducer<Text, IntWritable,  
Text, IntWritable>.Context context) throws IOException, InterruptedException {
```

```
int sum = 0;
```

```
for (IntWritable val : values)
```

```
sum += val.get();
```

```
this.countMap.put(new Text(key), new IntWritable(sum));
```

```
}
```

```
protected void cleanup(Reducer<Text, IntWritable, Text, IntWritable>.Context context)
```

```
throws IOException, InterruptedException {
```

```
Map<Text, IntWritable> sortedMap = MiscUtils.sortByValues(this.countMap);
```

```
int counter = 0;
```

```
for (Text key : sortedMap.keySet())
```

```
{ if (counter++ == 20)
```

```
break;
```

```
context.write(key, sortedMap.get(key));
```

```
}
```

```
}
```

```
}
```

OUTPUT

```

C:\hadoop-3.3.0\sbin>jps
11072 DataNode
20528 Jps
5620 ResourceManager
15532 NodeManager
5140 NameNode

C:\hadoop-3.3.0\sbin>hdfs dfs -mkdir /input_dir

C:\hadoop-3.3.0\sbin>hdfs dfs -ls /
Found 1 items
drwxr-xr-x   - Anusree supergroup          0 2021-05-08 19:46 /input_dir

C:\hadoop-3.3.0\sbin>hdfs dfs -copyFromLocal C:\input.txt /input_dir

C:\hadoop-3.3.0\sbin>hdfs dfs -ls /input_dir
Found 1 items
-rw-r--r--   1 Anusree supergroup        36 2021-05-08 19:48 /input_dir/input.txt

C:\hadoop-3.3.0\sbin>hdfs dfs -cat /input_dir/input.txt
hello
world
hello
hadoop
bye

C:\hadoop-3.3.0\sbin>hadoop jar C:\sort.jar samples.topn.TopN /input_dir/input.txt /output_dir
2021-05-08 19:54:54,582 INFO client.DefaultHadoopFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2021-05-08 19:54:55,291 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/staging/Anusree/.staging/job_1620483374279_0001
2021-05-08 19:54:55,821 INFO input.FileInputFormat: Total input files to process : 1
2021-05-08 19:54:56,261 INFO mapreduce.JobSubmitter: number of splits:1
2021-05-08 19:54:56,552 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1620483374279_0001
2021-05-08 19:54:56,552 INFO mapreduce.JobSubmitter: Executing with tokens: []
2021-05-08 19:54:56,843 INFO conf.Configuration: resource-types.xml not found
2021-05-08 19:54:56,843 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2021-05-08 19:54:57,387 INFO impl.YarnClientImpl: Submitted application application_1620483374279_0001
2021-05-08 19:54:57,587 INFO mapreduce.Job: The url to track the job: http://LAPTOP-J6329E5D:8088/proxy/application_1620483374279_0001/
2021-05-08 19:54:57,588 INFO mapreduce.Job: Running job: job_1620483374279_0001
2021-05-08 19:55:13,792 INFO mapreduce.Job: Job job_1620483374279_0001 running in uber mode : false
2021-05-08 19:55:13,794 INFO mapreduce.Job:  map 0% reduce 0%
2021-05-08 19:55:20,020 INFO mapreduce.Job:  map 100% reduce 0%
2021-05-08 19:55:27,116 INFO mapreduce.Job:  map 100% reduce 100%
2021-05-08 19:55:33,199 INFO mapreduce.Job: Job job_1620483374279_0001 completed successfully
2021-05-08 19:55:33,334 INFO mapreduce.Job: Counters: 54
    File System Counters
      FILE: Number of bytes read=65
      FILE: Number of bytes written=530397
      FILE: Number of read operations=0
      FILE: Number of large read operations=0
      FILE: Number of write operations=0
      HDFS: Number of bytes read=142
      HDFS: Number of bytes written=31
      HDFS: Number of read operations=8
      HDFS: Number of large read operations=0
      HDFS: Number of write operations=2
      HDFS: Number of bytes read erasure-coded=0

```

```

C:\hadoop-3.3.0\sbin>hdfs dfs -cat /output_dir/*
hello      2
hadoop     1
world      1
bye        1

C:\hadoop-3.3.0\sbin>

```