VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT
on

Big Data Analytics (23CS6PCBDA)

Submitted by:

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Under the Guidance of
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Assistant Professor, BMSCE

in partial fulfillment for the award of the degree of
BACHELOR OF ENGINEERING
in
COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING
(Autonomous Institution under VTU)
BENGALURU-560019
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B. M. S. College of Engineering,
Bull Temple Road, Bangalore 560019
(Affiliated To Visvesvaraya Technological University, Belgaum)
Department of Computer Science and Engineering

CERTIFICATE

This is to certify that the Lab work entitled "**Big Data Analytics**" carried out by **Manvi Sharma (1BM22CS149),** 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 **Big Data Analytics – (23CS6PCBDA)** work prescribed for the said degree.

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LAB 1
MongoDb CRUD operations

```
Atlas atlas-z7tbbe-shard-0 [primary] test> use myDB
switched to db myDB
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db
myDB
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.createCollection("Student")
{ ok: 1 }
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.createCollection("Faculty")
{ ok: 1 }
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Faculty.drop()
true
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.insert({_id:1,StudName:"Jonathan",Grade:"VI",Hobbies:"Browsing"});

DeprecationWarning: Collection.insert() is deprecated. Use insertOne, insertMany, or bulkWrite.
{ acknowledged: true, insertedIds: { '0': 1 } }
Atlas atlas-z7tbbe-shard-0 [primary] myDB> var mystudent = [{_id:4,StudName:"Saurav",Grade:"V",Hobbies:"Dance"},{_id:5,StudName:"Kumar",Grade:"VII",Hobbies:"Singing"}]

Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.insert(mystudent)
{ acknowledged: true, insertedIds: { '0': 4, '1': 5 } }
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.update({StudName:"Jonathan"},{$set:{StudName:"Gaurav"}});
DeprecationWarning: Collection.update() is deprecated. Use updateOne, updateMany, or bulkWrite.
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find()
[
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' },
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' }
]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find({StudName:"Kumar"})
[ { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' } ]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find({Grade:{$eq:'VII'}});
\[ { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' } ]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find({Grade:{$eq:'VII'}});
[ { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' } ]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.count();
DeprecationWarning: Collection.count() is deprecated. Use countDocuments or estimatedDocumentCount.
3
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find().sort({StudName:1});
[
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' },
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' }
]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find().sort({Grade:1});
[
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' },
```

```
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find()
[
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' },
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' }
]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find({StudName:"Kumar"})
[ { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' } ]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find({Grade:{$eq:'VII'}});
\[ { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' } ]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find({Grade:{$eq:'VII'}});
[ { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' } ]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.count();
DeprecationWarning: Collection.count() is deprecated. Use countDocuments or estimatedDocumentCount.
3
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find().sort({StudName:1});
[
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' },
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' }
]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find().sort({Grade:1});
[
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' },
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' }
]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find().sort({Grade:-1});
[
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' },
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' }
]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.insert({_id:2,StudName:"Aryan",Grade:"IV",Hobbies:"Sketching"});
{ acknowledged: true, insertedIds: { '0': 2 } }
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find()
[
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' },
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' },
  { _id: 2, StudName: 'Aryan', Grade: 'IV', Hobbies: 'Sketching' }
]
Atlas atlas-z7tbbe-shard-0 [primary] myDB> db.Student.find().sort({Grade:1});
[
  { _id: 2, StudName: 'Aryan', Grade: 'IV', Hobbies: 'Sketching' },
  { _id: 4, StudName: 'Saurav', Grade: 'V', Hobbies: 'Dance' },
  { _id: 1, StudName: 'Gaurav', Grade: 'VI', Hobbies: 'Browsing' },
  { _id: 5, StudName: 'Kumar', Grade: 'VII', Hobbies: 'Singing' }
]
```

LAB 2

Student database

```
myDB> db.students.drop();
true
myDB> show dbs
admin      40.00 KiB
config     72.00 KiB
local     120.00 KiB
students   72.00 KiB
myDB> db.createCollection("Student");
{ ok: 1 }
myDB> show dbs
admin      40.00 KiB
config     72.00 KiB
local     120.00 KiB
myDB        8.00 KiB
students   72.00 KiB
myDB> db.Student.insert({_id:1,StudeName:"MichelleJacintha",Grade:"VII",Hobbies:"InternetSurfing",});
DeprecationWarning: Collection.insert() is deprecated. Use insertOne, insertMany, or bulkWrite.
{ acknowledged: true, insertedIds: { '0': 1 } }
myDB> db.Student.insertOne({_id:1,StudeName:"MichelleJacintha",Grade:"VII",Hobbies:"InternetSurfing",});
MongoServerError: E11000 duplicate key error collection: myDB.Student index: _id_ dup key: { _id: 1 }
myDB> db.Student.insertOne({_id:2,StudeName:"MichelleJacintha",Grade:"VII",Hobbies:"InternetSurfing",});
{ acknowledged: true, insertedId: 2 }
myDB> db.Student.find();
[
  {
    _id: 1,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  },
  {
    _id: 2,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  }
]
```

```
]
myDB> show collections;
Student
myDB> db.Student.updateOne({_id:2,StudName:"AryanDavid",Grade:"VIII"},{$set:{Hobbies:"Chess"}},{upsert:true});
MongoServerError: E11000 duplicate key error collection: myDB.Student index: _id_ dup key: { _id: 2 }
myDB> db.Student.find({StudName:"AryanDavid"});

myDB> db.Student.find();
[
  {
    _id: 1,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  },
  {
    _id: 2,
    StudeName: 'AryanDavid',
    Grade: 'VIII',
    Hobbies: 'Skating'
  }
]
myDB> db.Student.find({StudeName:"AryanDavid"});
[
  {
    _id: 2,
    StudeName: 'AryanDavid',
    Grade: 'VIII',
    Hobbies: 'Skating'
  }
]
myDB> db.Student.updateOne({_id:2,StudeName:"AryanDavid",Grade:"VIII"},{$set:{Hobbies:"Chess"}},{upsert:true});
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
myDB> db.Student.find();
[
  {
    _id: 1,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  },
  { _id: 2, StudeName: 'AryanDavid', Grade: 'VIII', Hobbies: 'Chess' }
]
myDB> db.Student.find({StudeName:"AryanDavid"});
[
  { _id: 2, StudeName: 'AryanDavid', Grade: 'VIII', Hobbies: 'Chess' }
]
```

```
myDB> db.Student.find({Grade:{Seq:'VII'}}).pretty();
[
  {
    _id: 1,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  }
]
myDB> db.Student.find({Hobbies:{$in:['Chess','Skating']}}).pretty();
[
  { _id: 2, StudeName: 'AryanDavid', Grade: 'VIII', Hobbies: 'Chess' }
]
myDB> db.Student.find({StudeName:/^M/}).pretty();
[
  {
    _id: 1,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  }
]
myDB> db.Student.find({StudeName:/e/}).pretty();
[
  {
    _id: 1,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  }
]
myDB> db.Student.find({StudeName:/d/}).pretty();
[
  { _id: 2, StudeName: 'AryanDavid', Grade: 'VIII', Hobbies: 'Chess' }
]
myDB> db.
... db.Student.count();
DeprecationWarning: Collection.count() is deprecated. Use countDocuments or estimatedDocumentCount.
0
myDB> db.Student.count();
2
myDB> db.Student.find().sort({StudName:-1}).pretty();
[
  {
    _id: 1,
    StudeName: 'MichelleJacintha',
    Grade: 'VII',
    Hobbies: 'InternetSurfing'
  },
  { _id: 2, StudeName: 'AryanDavid', Grade: 'VIII', Hobbies: 'Chess' }
]
```

LAB 4

Working with Cassandra in ubuntu terminal

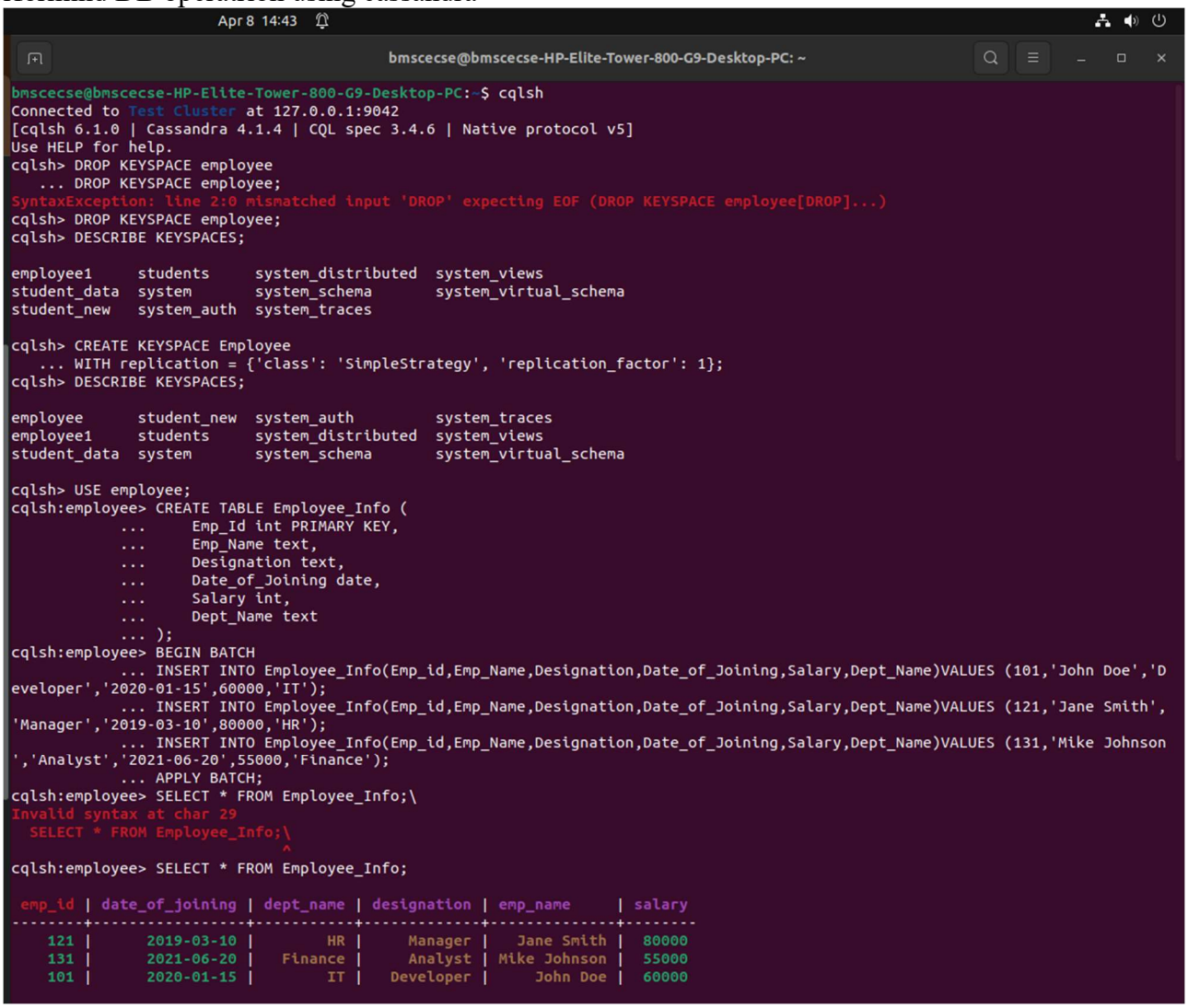
```
cqlsh> create keyspace Students_avy with replication = {'class':'SimpleStrategy'
,'replication_factor':1};
cqlsh> describe keyspaces;

comp      education   students      system_auth         system_views
companny  employee    students_avy  system_distributed   system_virtual_schema
company   javatpoint  studentss     system_schema
company1  student     system        system_traces
```

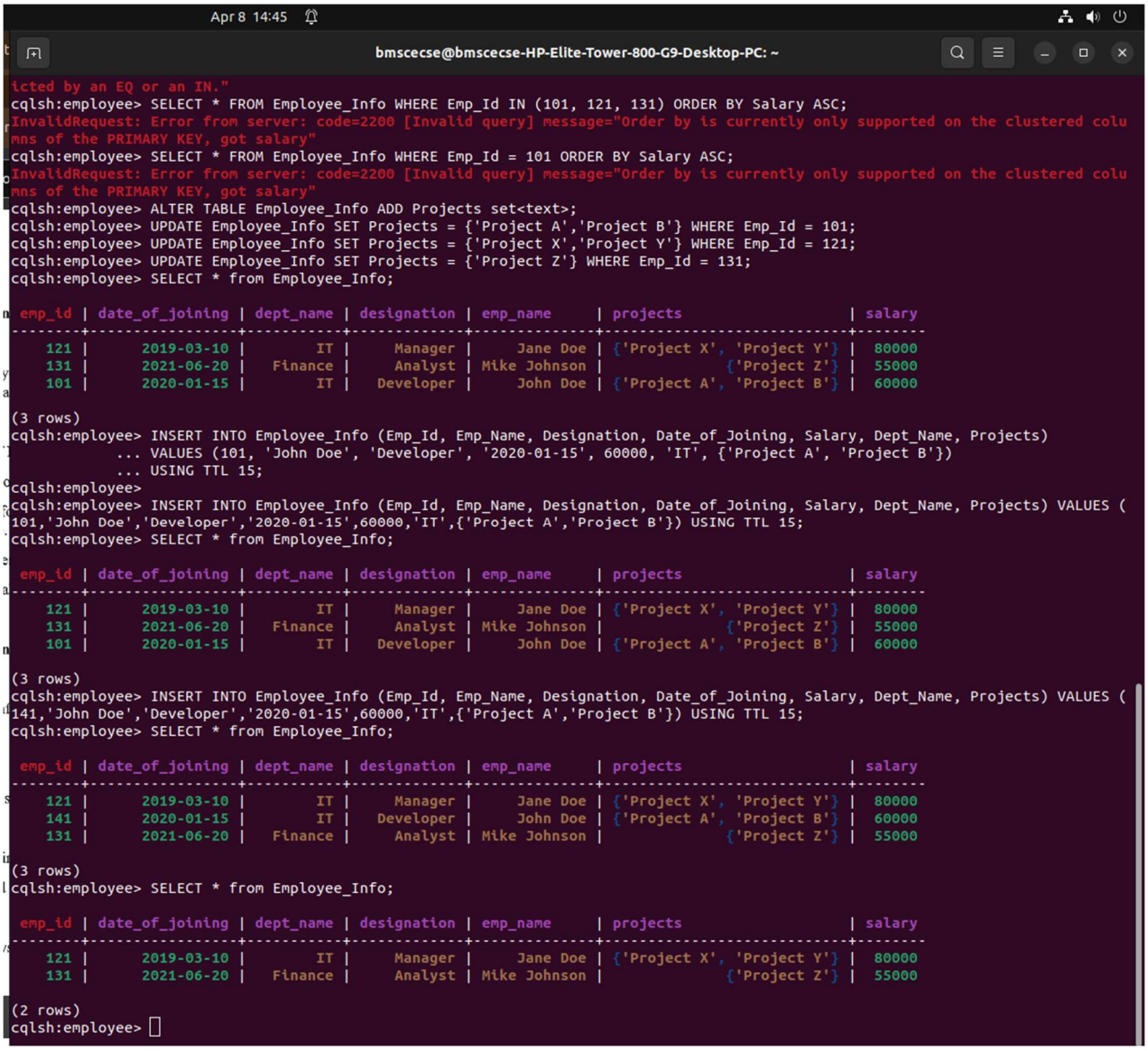
```
cqlsh:students_avy> begin batch
                ... insert into students_info(Roll_No,StudName,DateOfJoining,last_exam_percent) values(1,'Asha','2012-03-12',79.9)
                ... insert into students_info(Roll_No,StudName,DateOfJoining,last_exam_percent) values(2,'Krian','2012-03-12',89.9)
                ... insert into students_info(Roll_No,StudName,DateOfJoining,last_exam_percent) values(3,'Tarun','2012-03-12',78.9)
                ... insert into students_info(Roll_No,StudName,DateOfJoining,last_exam_percent) values(4,'Samrth','2012-03-12',90.9)
                ... insert into students_info(Roll_No,StudName,DateOfJoining,last_exam_percent) values(5,'Smitha','2012-03-12',67.9)
                ... insert into students_info(Roll_No,StudName,DateOfJoining,last_exam_percent) values(6,'Rohan','2012-03-12',56.9)
                ... apply batch;
cqlsh:students_avy> select * from students_info;

 roll_no | dateofjoining                   | last_exam_percent | studname
---------+---------------------------------+-------------------+----------
       5 | 2012-03-11 18:30:00.000000+0000 |              67.9 |   Smitha
       1 | 2012-03-11 18:30:00.000000+0000 |              79.9 |     Asha
       2 | 2012-03-11 18:30:00.000000+0000 |              89.9 |    Krian
       4 | 2012-03-11 18:30:00.000000+0000 |              90.9 |   Samrth
       6 | 2012-03-11 18:30:00.000000+0000 |              56.9 |    Rohan
       3 | 2012-03-11 18:30:00.000000+0000 |              78.9 |    Tarun

(6 rows)
cqlsh:students_avy> select * from students_info where Roll_No in (1,2,3);

 roll_no | dateofjoining                   | last_exam_percent | studname
---------+---------------------------------+-------------------+----------
       1 | 2012-03-11 18:30:00.000000+0000 |              79.9 |     Asha
       2 | 2012-03-11 18:30:00.000000+0000 |              89.9 |    Krian
       3 | 2012-03-11 18:30:00.000000+0000 |              78.9 |    Tarun

(3 rows)
cqlsh:students_avy> select * from students_info where StudName = 'Asha';
InvalidRequest: Error from server: code=2200 [Invalid query] message="Cannot execute this query as it might involve data filtering and
query despite the performance unpredictability, use ALLOW FILTERING"
```

```
cqlsh:students_avy> select Roll_No, StudName from students_info LIMIT 2;

 roll_no | studname
---------+----------
       5 |   Smitha
       1 |     Asha

(2 rows)
cqlsh:students_avy> create index on students_info(StudName);
cqlsh:students_avy> select * from students_info where StudName = 'Asha';

 roll_no | dateofjoining                   | last_exam_percent | studname
---------+---------------------------------+-------------------+----------
       1 | 2012-03-11 18:30:00.000000+0000 |              79.9 |     Asha

(1 rows)
cqlsh:students_avy> select Roll_No as "USN" from students_info;

 USN
-----
   5
   1
   2
   4
   6
   3

(6 rows)
cqlsh:students_avy> update students_info set StudName='David Sheen' where Roll_No = 2;
cqlsh:students_avy> update students_info set Roll_No = 6 where Roll_No = 3;
InvalidRequest: Error from server: code=2200 [Invalid query] message="PRIMARY KEY part roll_no found in SET part"
cqlsh:students_avy> select * from students_info;

 roll_no | dateofjoining                   | last_exam_percent | studname
---------+---------------------------------+-------------------+-------------
       5 | 2012-03-11 18:30:00.000000+0000 |              67.9 |      Smitha
       1 | 2012-03-11 18:30:00.000000+0000 |              79.9 |        Asha
       2 | 2012-03-11 18:30:00.000000+0000 |              89.9 | David Sheen
       4 | 2012-03-11 18:30:00.000000+0000 |              90.9 |      Samrth
       6 | 2012-03-11 18:30:00.000000+0000 |              56.9 |       Rohan
       3 | 2012-03-11 18:30:00.000000+0000 |              78.9 |       Tarun

(6 rows)
cqlsh:students_avy> delete last_exam_percent from students_info where Roll_No = 2;
```

LAB 5

Performind DB operatrion using cassandra




Apr 8 14:45
bmscecse@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC: ~
icted by an EQ or an IN."
cqlsh:employee> SELECT * FROM Employee_Info WHERE Emp_Id IN (101, 121, 131) ORDER BY Salary ASC;
InvalidRequest: Error from server: code=2200 [Invalid query] message="Order by is currently only supported on the clustered colu
mns of the PRIMARY KEY, got salary"
cqlsh:employee> SELECT * FROM Employee_Info WHERE Emp_Id = 101 ORDER BY Salary ASC;
InvalidRequest: Error from server: code=2200 [Invalid query] message="Order by is currently only supported on the clustered colu
mns of the PRIMARY KEY, got salary"
cqlsh:employee> ALTER TABLE Employee_Info ADD Projects set<text>;
cqlsh:employee> UPDATE Employee_Info SET Projects = {'Project A','Project B'} WHERE Emp_Id = 101;
cqlsh:employee> UPDATE Employee_Info SET Projects = {'Project X','Project Y'} WHERE Emp_Id = 121;
cqlsh:employee> UPDATE Employee_Info SET Projects = {'Project Z'} WHERE Emp_Id = 131;
cqlsh:employee> SELECT * from Employee_Info;
emp_id | date_of_joining | dept_name | designation | emp_name | projects | salary
121 | 2019-03-10 | IT | Manager | Jane Doe | {'Project X', 'Project Y'} | 80000
131 | 2021-06-20 | Finance | Analyst | Mike Johnson | {'Project Z'} | 55000
101 | 2020-01-15 | IT | Developer | John Doe | {'Project A', 'Project B'} | 60000
(3 rows)
cqlsh:employee> INSERT INTO Employee_Info (Emp_Id, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name, Projects)
... VALUES (101, 'John Doe', 'Developer', '2020-01-15', 60000, 'IT', {'Project A', 'Project B'})
... USING TTL 15;
cqlsh:employee>
cqlsh:employee> INSERT INTO Employee_Info (Emp_Id, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name, Projects) VALUES (
101,'John Doe','Developer','2020-01-15',60000,'IT',{'Project A','Project B'}) USING TTL 15;
cqlsh:employee> SELECT * from Employee_Info;
emp_id | date_of_joining | dept_name | designation | emp_name | projects | salary
121 | 2019-03-10 | IT | Manager | Jane Doe | {'Project X', 'Project Y'} | 80000
131 | 2021-06-20 | Finance | Analyst | Mike Johnson | {'Project Z'} | 55000
101 | 2020-01-15 | IT | Developer | John Doe | {'Project A', 'Project B'} | 60000
(3 rows)
cqlsh:employee> INSERT INTO Employee_Info (Emp_Id, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name, Projects) VALUES (
141,'John Doe','Developer','2020-01-15',60000,'IT',{'Project A','Project B'}) USING TTL 15;
cqlsh:employee> SELECT * from Employee_Info;
emp_id | date_of_joining | dept_name | designation | emp_name | projects | salary
121 | 2019-03-10 | IT | Manager | Jane Doe | {'Project X', 'Project Y'} | 80000
141 | 2020-01-15 | IT | Developer | John Doe | {'Project A', 'Project B'} | 60000
131 | 2021-06-20 | Finance | Analyst | Mike Johnson | {'Project Z'} | 55000
(3 rows)
cqlsh:employee> SELECT * from Employee_Info;
emp_id | date_of_joining | dept_name | designation | emp_name | projects | salary
121 | 2019-03-10 | IT | Manager | Jane Doe | {'Project X', 'Project Y'} | 80000
131 | 2021-06-20 | Finance | Analyst | Mike Johnson | {'Project Z'} | 55000
(2 rows)
cqlsh:employee>

LAB 6

Hadoop basic command excecution in Ubuntu

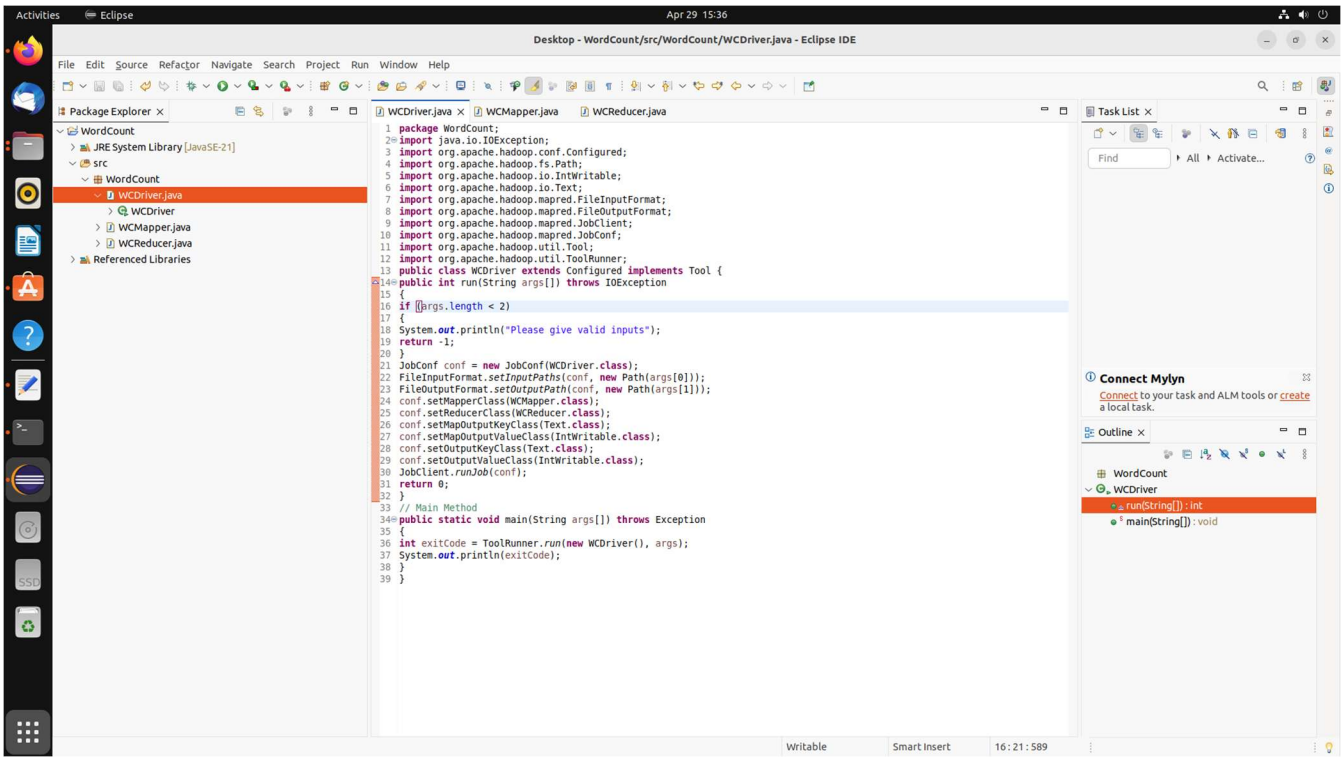
```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as hadoop in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
localhost: namenode is running as process 6418.  Stop it first and ensure /tmp/hadoop-hadoop-namenode.pid file is empty before retry.
Starting datanodes
localhost: datanode is running as process 6591.  Stop it first and ensure /tmp/hadoop-hadoop-datanode.pid file is empty before retry.
Starting secondary namenodes [bmscecse-HP-Elite-Tower-800-G9-Desktop-PC]
bmscecse-HP-Elite-Tower-800-G9-Desktop-PC: secondarynamenode is running as process 6870.  Stop it first and ensure /tmp/hadoop-hadoop-secondarynamenode.
file is empty before retry.
Starting resourcemanager
resourcemanager is running as process 7157.  Stop it first and ensure /tmp/hadoop-hadoop-resourcemanager.pid file is empty before retry.
Starting nodemanagers
localhost: nodemanager is running as process 7319.  Stop it first and ensure /tmp/hadoop-hadoop-nodemanager.pid file is empty before retry.
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ jps
6418 NameNode
7157 ResourceManager
6870 SecondaryNameNode
7319 NodeManager
12717 Jps
6591 DataNode
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /
\Found 1 items
drwxr-xr-x   - hadoop supergroup          0 2025-04-15 14:32 /rgs
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ nano /home/hadoop/Desktop/file1.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -copyFromLocal /home/hadoop/Desktop/file1.txt /rgs/test.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /rgs
Found 1 items
-rw-r--r--   1 hadoop supergroup         89 2025-04-15 15:03 /rgs/test.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /rgs
Found 1 items
-rw-r--r--   1 hadoop supergroup         89 2025-04-15 15:03 /rgs/test.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop jar /home/hadoop/Desktop/WordCount.jar wordcount.WordCount /rgs/test.txt /output
JAR does not exist or is not a normal file: /home/hadoop/Desktop/WordCount.jar
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -mkdir /abc
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /Hadoop
ls: `/Hadoop': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ Ls
Ls: command not found
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ ls
'ACFrOgCujhJsUnwp0NA9r5ZGDw7_C_49d0lfOe1dpiqetFZ8Ghfx-ugoCx6lMrnJLRY-IUXyqoEhxlEtB1L483dCRqjzgfQvp5XHT-eAinKK5NXbdZsV2XfEr7owS5Wb8eY_3vAbH2TDL9KwBokfZ2e
Sd9boAfh5Vv2vjw==.pdf'
 Desktop
 Documents
 Downloads
 eclipse-workspace
 hadoop
 hadoop-3.3.6.tar.gz
 hadoopdata
 hs_err_pid5585.log
 hs_err_pid8027.log
 hs_err_pid8572.log
 Music
 Pictures
```

```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -mkdir /abc
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /Hadoop
ls: `/Hadoop': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ Ls
Ls: command not found
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ ls
'ACFrOgCujhJsUnwp0NA9r5ZGDw7_C_49d0lfOe1dpiqetFZ8Ghfx-ugoCx6lMrnJLRY-IUXyqoEhxlEtB1L483dCRqjzgfQvp5XHT-eAinKK5NXbdZsV2XfEr7owS5Wb8eY_3vAbH2TDL9KwBokfZ2e
Sd9boAfh5Vv2vjw==.pdf'
 Desktop
 Documents
 Downloads
 eclipse-workspace
 hadoop
 hadoop-3.3.6.tar.gz
 hadoopdata
 hs_err_pid5585.log
 hs_err_pid8027.log
 hs_err_pid8572.log
 Music
 Pictures
 Public
 snap
 Templates
 Videos
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /hadoop
ls: `/hadoop': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -mkdir /hadoop
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /hadoop
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -put /home/hadoop/Desktop/Welcome.txt /abc/WC.txt
put: `/home/hadoop/Desktop/Welcome.txt': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ nano /home/hadoop/Desktop/welcome.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -put /home/hadoop/Desktop/Welcome.txt /abc/WC.txt
put: `/home/hadoop/Desktop/Welcome.txt': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -put /home/hadoop/Desktop/welcome.txt /abc/WC.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -cat /abc/WC.txt
hii welcome to hadoop tutorial
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -put /home/hadoop/Desktop/welcome.txt /abc/WC.txtHadoop
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ WC2.txthdfs dfs -cat /abc/WC2.txt
WC2.txthdfs: command not found
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ WC.txthdfs dfs -cat /abc/WC2.txt
WC.txthdfs: command not found
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ get [-crc]
Command 'get' not found, but there are 18 similar ones.
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -put /home/hadoop/Desktop/Welcome.txt /abc/WC.txtHadoop
put: `/abc/WC.txtHadoop': File exists
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ WC2.txthdfs dfs -cat /abc/WC2.txt
WC2.txthdfs: command not found
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -cat /abc/WC2.txt
cat: `/abc/WC2.txt': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -cat /abc/WC.txt
hii welcome to hadoop tutorial
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -copyToLocal /abc/WC.txt /home/hadoop/Desktop
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hdfs dfs -cat /abc/WC.txt
hii welcome to hadoop tutorial
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ S
```

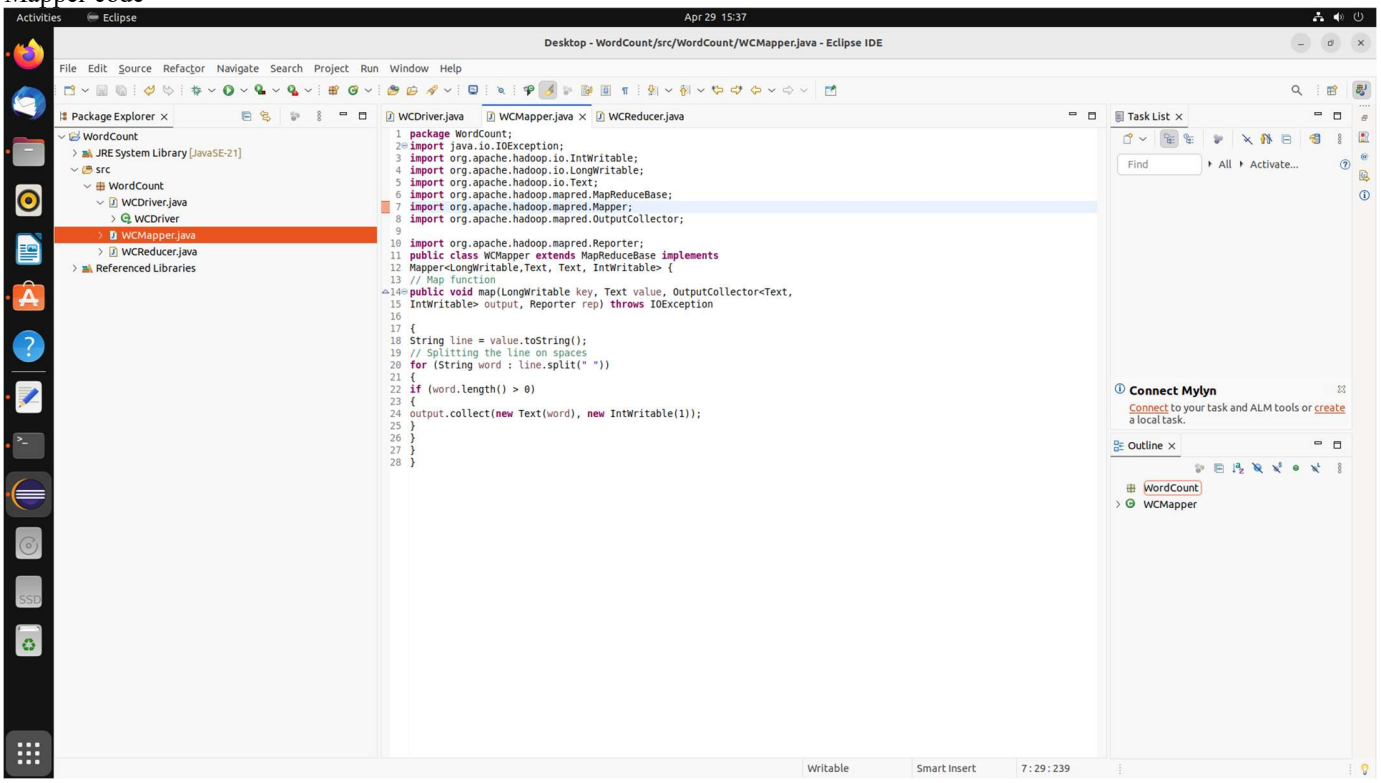
LAB 7

Map reduce program for word count using eclipse

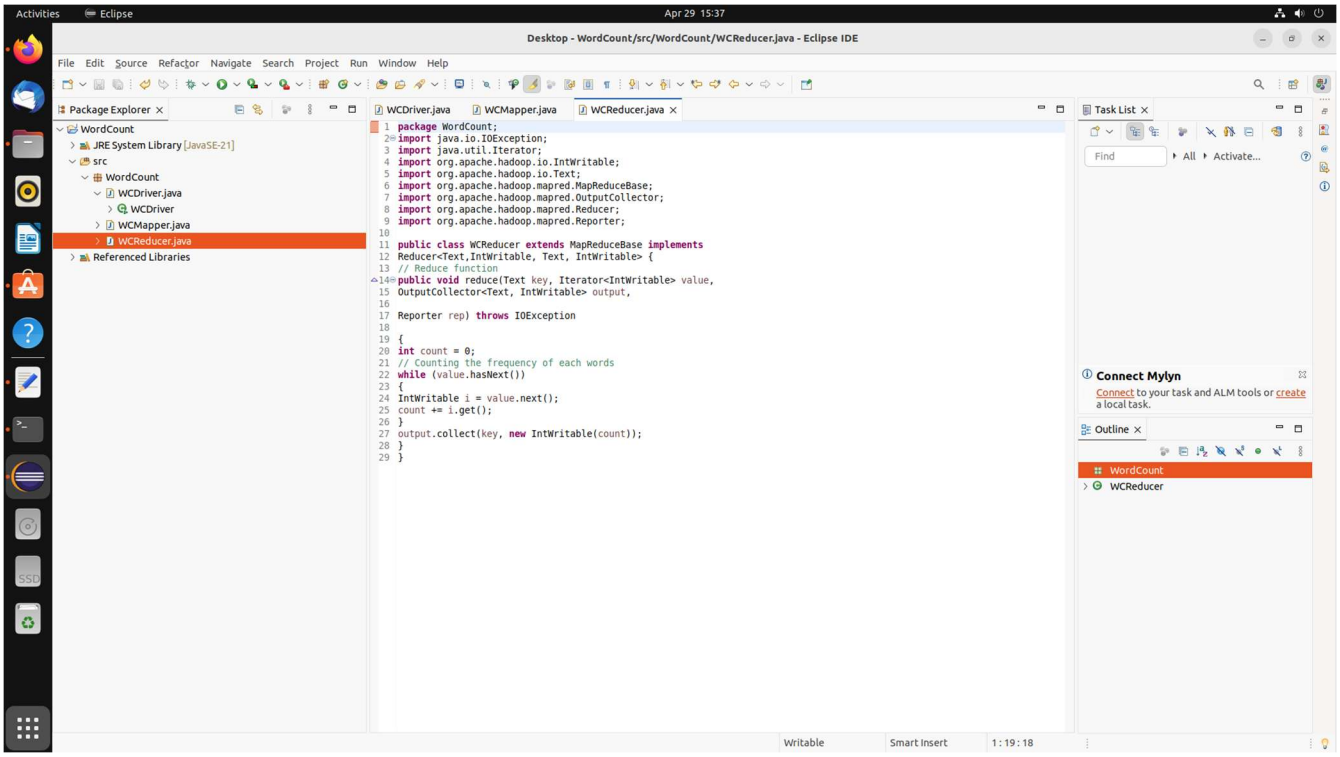
Driver code

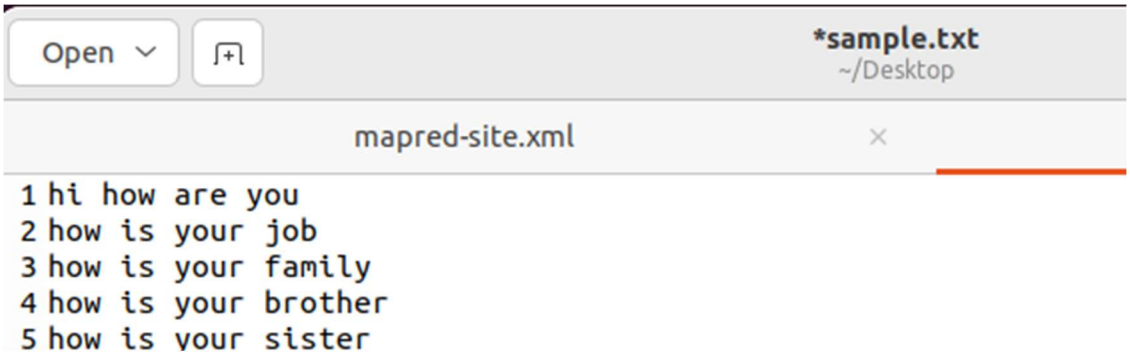


Mapper code



Reducer code

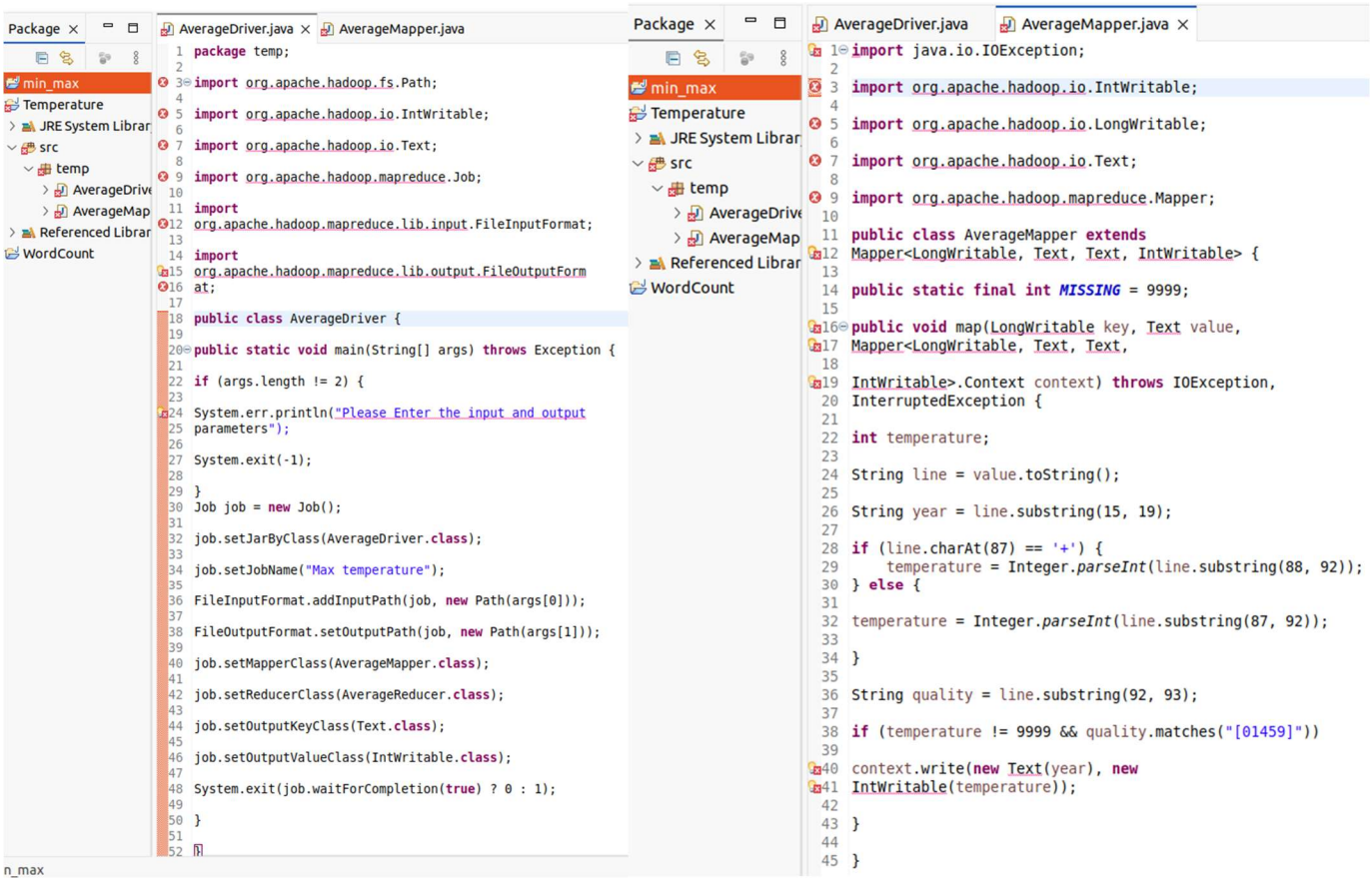





```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~/Desktop$ hadoop fs -copyFromLocal -f /home/hadoop/Desktop/file1.txt /rgs/test.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~/Desktop$ hadoop jar /home/hadoop/Desktop/WordCount.jar wordcount.WordCount /rgs/test.txt /output
JAR does not exist or is not a normal file: /home/hadoop/Desktop/WordCount.jar
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~/Desktop$ hadoop jar /home/hadoop/Desktop/Word_Count.jar wordcount.WordCount /rgs/test.txt /output
Exception in thread "main" java.lang.ClassNotFoundException: wordcount.WordCount
        at java.base/java.net.URLClassLoader.findClass(URLClassLoader.java:476)
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:594)
        at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:527)
        at java.base/java.lang.Class.forName0(Native Method)
        at java.base/java.lang.Class.forName(Class.java:398)
        at org.apache.hadoop.util.RunJar.run(RunJar.java:321)
        at org.apache.hadoop.util.RunJar.main(RunJar.java:241)
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~/Desktop$ hadoop fs -cat /output/part-00000
are     1
brother 1
family  1
hi      1
how     5
is      4
job     1
sister  1
you     1
your    4
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~/Desktop$ hadoop fs -ls /output
Found 2 items
-rw-r--r--   1 hadoop supergroup          0 2024-05-21 15:21 /output/_SUCCESS
-rw-r--r--   1 hadoop supergroup         69 2024-05-21 15:21 /output/part-00000
```

LAB 8

Map reduce program for weather . Find average temperature. Find min max temperature



```
Package ×
min_max
Temperature
JRE System Librar
src
temp
AverageDrive
AverageMap
Referenced Librar
WordCount
```

```
AverageDriver.java ×  AverageMapper.java
1  package temp;
2
3  import org.apache.hadoop.fs.Path;
4
5  import org.apache.hadoop.io.IntWritable;
6
7  import org.apache.hadoop.io.Text;
8
9  import org.apache.hadoop.mapreduce.Job;
10
11 import
12 org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
13
14 import
15 org.apache.hadoop.mapreduce.lib.output.FileOutputForm
16 at;
17
18 public class AverageDriver {
19
20 public static void main(String[] args) throws Exception {
21
22 if (args.length != 2) {
23
24 System.err.println("Please Enter the input and output
25 parameters");
26
27 System.exit(-1);
28
29 }
30 Job job = new Job();
31
32 job.setJarByClass(AverageDriver.class);
33
34 job.setJobName("Max temperature");
35
36 FileInputFormat.addInputPath(job, new Path(args[0]));
37
38 FileOutputFormat.setOutputPath(job, new Path(args[1]));
39
40 job.setMapperClass(AverageMapper.class);
41
42 job.setReducerClass(AverageReducer.class);
43
44 job.setOutputKeyClass(Text.class);
45
46 job.setOutputValueClass(IntWritable.class);
47
48 System.exit(job.waitForCompletion(true) ? 0 : 1);
49
50 }
51
52 }
```

```
n_max
```

```
Package ×
min_max
Temperature
JRE System Librar
src
temp
AverageDrive
AverageMap
Referenced Librar
WordCount
```

```
AverageDriver.java  AverageMapper.java ×
1  import java.io.IOException;
2
3  import org.apache.hadoop.io.IntWritable;
4
5  import org.apache.hadoop.io.LongWritable;
6
7  import org.apache.hadoop.io.Text;
8
9  import org.apache.hadoop.mapreduce.Mapper;
10
11 public class AverageMapper extends
12 Mapper<LongWritable, Text, Text, IntWritable> {
13
14 public static final int MISSING = 9999;
15
16 public void map(LongWritable key, Text value,
17 Mapper<LongWritable, Text, Text,
18
19 IntWritable>.Context context) throws IOException,
20 InterruptedException {
21
22 int temperature;
23
24 String line = value.toString();
25
26 String year = line.substring(15, 19);
27
28 if (line.charAt(87) == '+') {
29     temperature = Integer.parseInt(line.substring(88, 92));
30 } else {
31
32 temperature = Integer.parseInt(line.substring(87, 92));
33
34 }
35
36 String quality = line.substring(92, 93);
37
38 if (temperature != 9999 && quality.matches("[01459]"))
39
40 context.write(new Text(year), new
41 IntWritable(temperature));
42
43 }
44
45 }
```

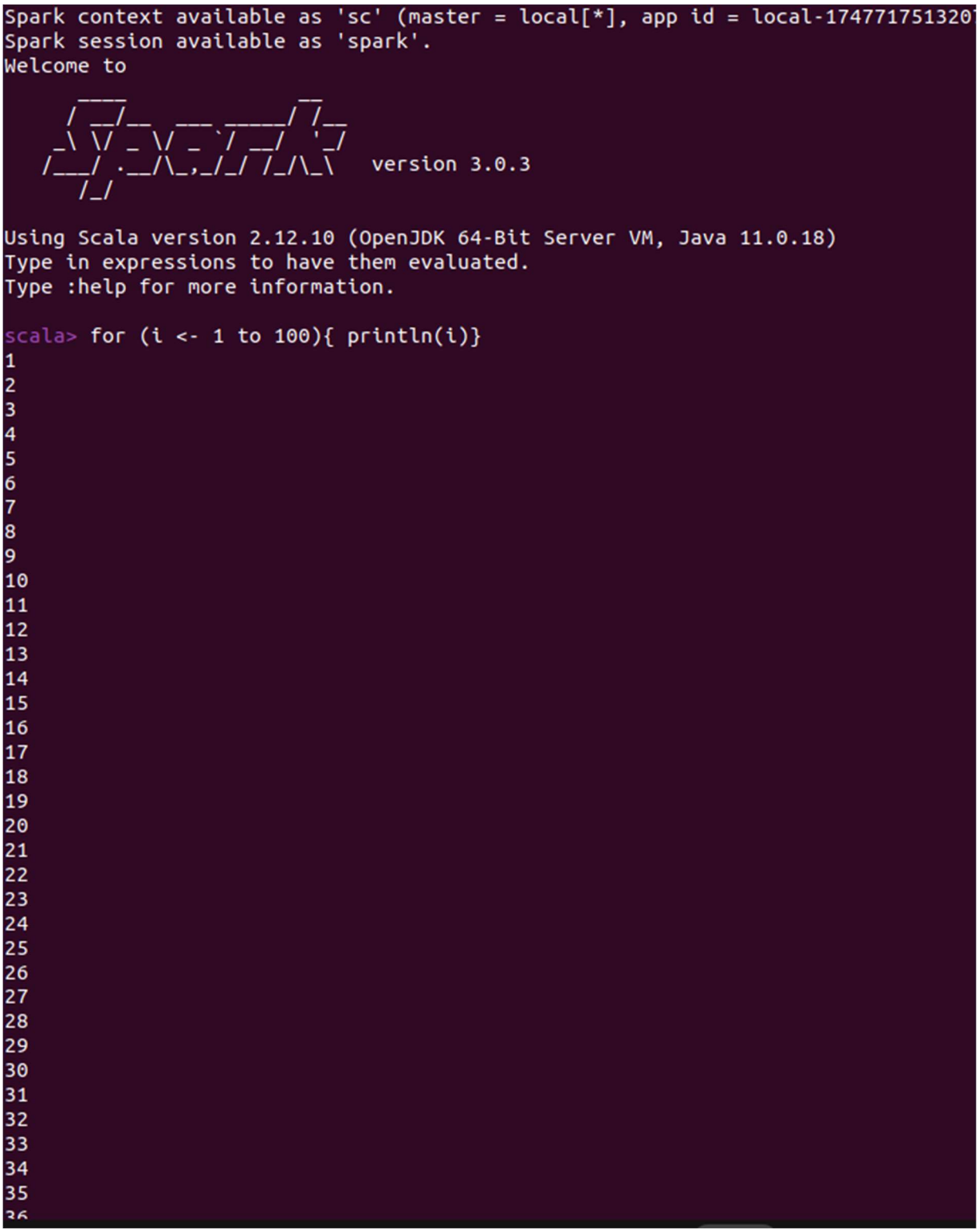
```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as hadoop in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
Starting datanodes
Starting secondary namenodes [bmscecse-HP-Elite-Tower-800-G9-Desktop-PC]
Starting resourcemanager
Starting nodemanagers
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ jps
7056 DataNode
7332 SecondaryNameNode
7638 ResourceManager
8231 Jps
5883 org.eclipse.equinox.launcher_1.6.1000.v20250227-1734.jar
7804 NodeManager
6877 NameNode
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /\
> ^C
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /
Found 4 items
drwxr-xr-x   - hadoop supergroup          0 2025-04-15 15:00 /FFF
drwxr-xr-x   - hadoop supergroup          0 2025-04-15 15:34 /LLL
drwxr-xr-x   - hadoop supergroup          0 2024-05-13 14:46 /file
drwxr-xr-x   - hadoop supergroup          0 2024-05-13 15:18 /newDataFlair
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /weather
ls: `/weather': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -mkdir /weather
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -copyFromLocal /home/hadoop/Desktop/1901.txt /weather/test.txt
```

```
2025-05-06 14:59:24,581 INFO mapreduce.Job: Counters: 36
	File System Counters
		FILE: Number of bytes read=153118
		FILE: Number of bytes written=1493804
		FILE: Number of read operations=0
		FILE: Number of large read operations=0
		FILE: Number of write operations=0
		HDFS: Number of bytes read=1776380
		HDFS: Number of bytes written=8
		HDFS: Number of read operations=15
		HDFS: Number of large read operations=0
		HDFS: Number of write operations=4
		HDFS: Number of bytes read erasure-coded=0
	Map-Reduce Framework
		Map input records=6565
		Map output records=6564
		Map output bytes=59076
		Map output materialized bytes=72210
		Input split bytes=103
		Combine input records=0
		Combine output records=0
		Reduce input groups=1
		Reduce shuffle bytes=72210
		Reduce input records=6564
		Reduce output records=1
		Spilled Records=13128
		Shuffled Maps =1
		Failed Shuffles=0
		Merged Map outputs=1
		GC time elapsed (ms)=0
		Total committed heap usage (bytes)=1266679808
	Shuffle Errors
		BAD_ID=0
		CONNECTION=0
		IO_ERROR=0
		WRONG_LENGTH=0
		WRONG_MAP=0
		WRONG_REDUCE=0
	File Input Format Counters
		Bytes Read=888190
	File Output Format Counters
		Bytes Written=8
```

```
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /weather
Found 2 items
drwxr-xr-x   - hadoop supergroup          0 2025-05-06 14:59 /weather/output
-rw-r--r--   1 hadoop supergroup     888190 2025-05-06 14:50 /weather/test.txt
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -ls /weather/output
Found 2 items
-rw-r--r--   1 hadoop supergroup          0 2025-05-06 14:59 /weather/output/_SUCCESS
-rw-r--r--   1 hadoop supergroup          8 2025-05-06 14:59 /weather/output/part-r-00000
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$ hadoop fs -cat /weather/output/part-r-00000
1901    46
hadoop@bmscecse-HP-Elite-Tower-800-G9-Desktop-PC:~$
```

LAB 9

Scala program to print number from 1 to 100 using for loop



Lab 10

Using RDD and flatmap count the frequency of words appear in a file and write out list of words where count > 4

Open

word_count.py
~/

```
from pyspark import SparkContext

sc = SparkContext("local", "SimpleWordCount")
text_file = sc.textFile("file1.txt")
counts = text_file.flatMap(lambda line: line.split()) \
                  .map(lambda word: (word, 1)) \
                  .reduceByKey(lambda a, b: a + b)
output = counts.collect()

for (word, count) in output:
    print(f"{word}: {count}")

```

```
hello: 2
bmsce: 3
how: 1
are: 1
you: 1
```