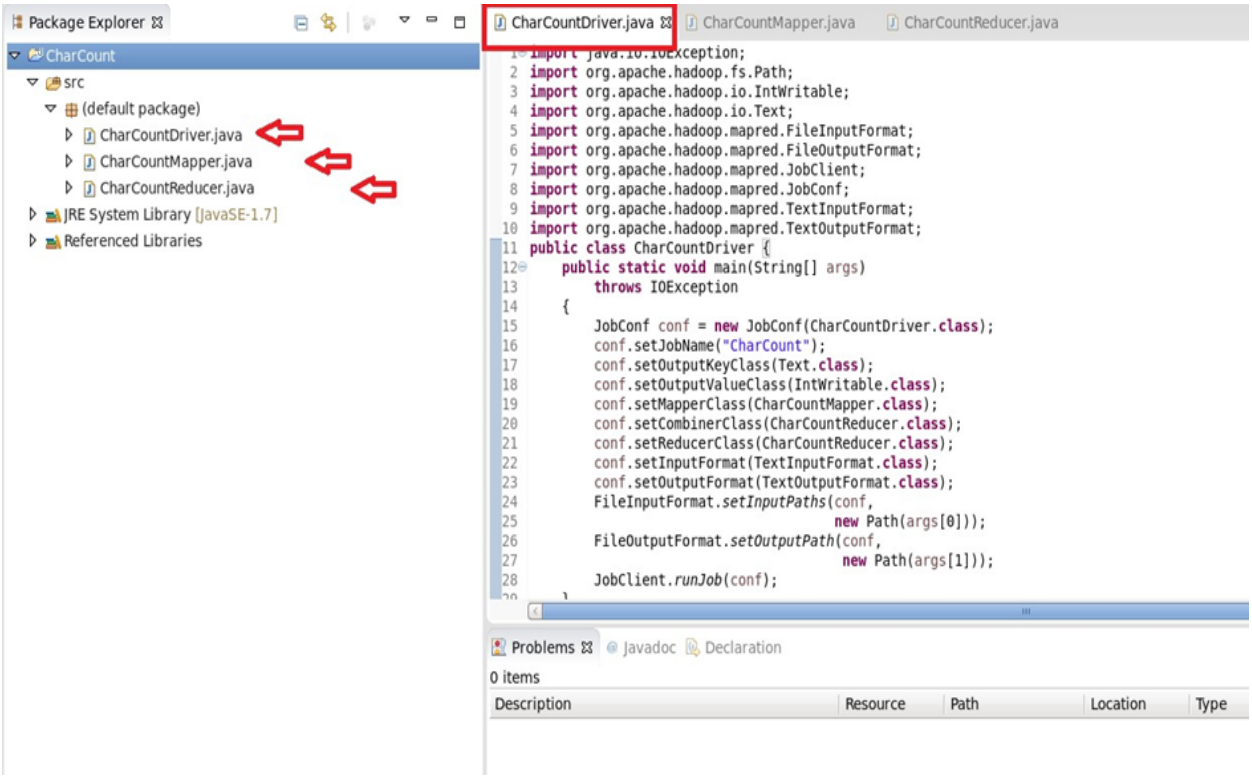
Aim : To Implement CharCount problem using Hadoop MapReduce in Eclipse.

Step 1 : Run your cloudera system. Open Eclipse.
Step 2 : Click on File > New > java project. Give Project Name (“CharCount”).
Step 3 : Click on Libraries tab. Then click on Add External JARs… Tab To add Hadoop Libraries.
Step 4 : Follow this steps :
Click on File System -> usr -> lib -> hadoop (Select all the libraries (JAR files)) -> Click OK.
Again Click on Add External JARs… -> client -> select all jar files -> ok -> Finish.
Step 5 : Now you will see project name “CharCount” on sidebar.
Right Click on Project name “CharCount” -> New -> class.

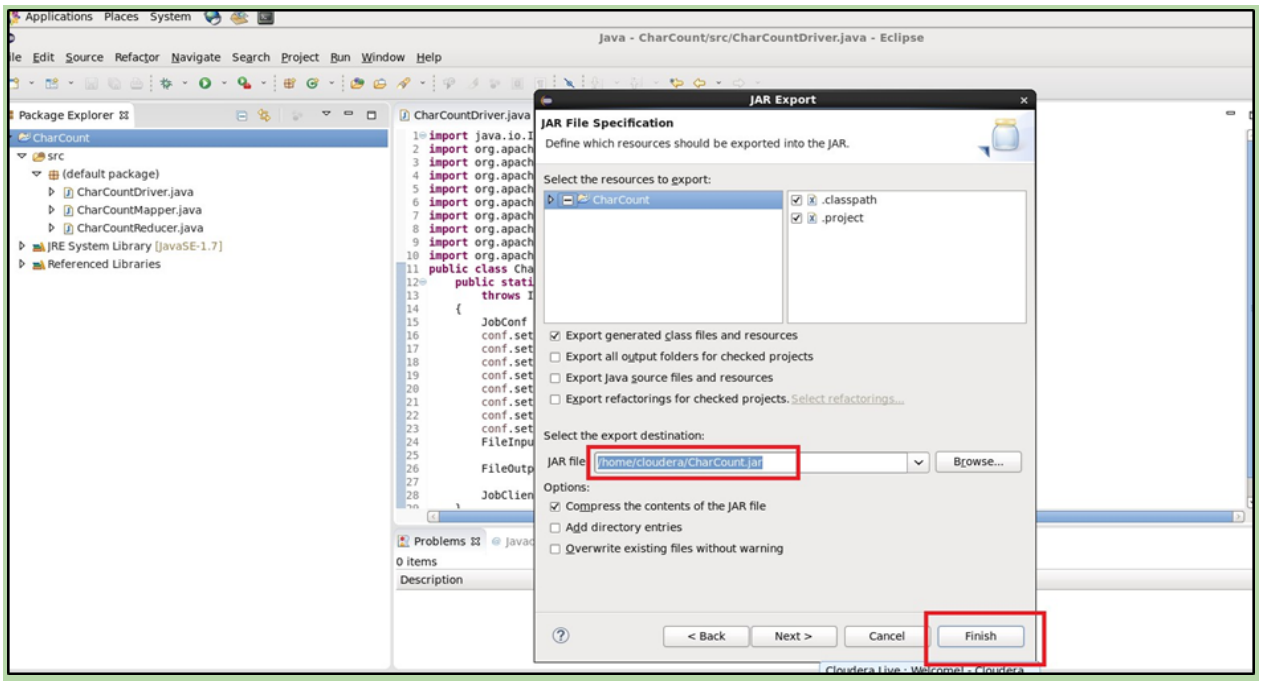
Create 3 new classes named :

CharCountDriver(having the main function)**,**
CharCountMapper,
CharCountReducer.



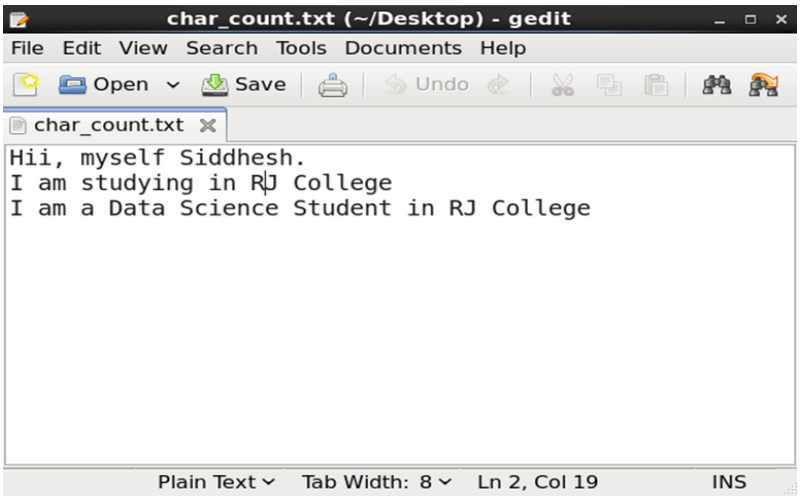
Step 6 : Write your code in java windows.

Step 7 : Right Click on the project name
CharCount -> Export -> Java -> JAR File ->
Next -> For select the export destination for
JAR file:
browse -> Name : CharCount.jar -> save in folder -> cloudera -> Finish -> OK



Step 8 : Now open terminal . follow this commands :

```
[cloudera@quickstart ~]$ cd Desktop
[cloudera@quickstart Desktop]$ ls
CharCount.jar    Enterprise.desktop  Kerberos.desktop  Parcels.desktop
Eclipse.desktop  Express.desktop     matrix_mul
[cloudera@quickstart Desktop]$ pwd
/home/cloudera/Desktop
[cloudera@quickstart Desktop]$ gedit char_count.txt
```




```
[cloudera@quickstart Desktop]$ cat char_count.txt
Hii, myself Siddhesh.
I am studying in RJ College
I am a Data Science Student in RJ College
```

```
[cloudera@quickstart Desktop]$ hdfs dfs -ls /
Found 6 items
drwxrwxrwx   - hdfs  supergroup          0 2017-10-23 09:15 /benchmarks
drwxr-xr-x   - hbase supergroup          0 2023-02-17 23:53 /hbase
drwxr-xr-x   - solr  solr                0 2017-10-23 09:18 /solr
drwxrwxrwt   - hdfs  supergroup          0 2023-02-03 02:48 /tmp
drwxr-xr-x   - hdfs  supergroup          0 2017-10-23 09:17 /user
drwxr-xr-x   - hdfs  supergroup          0 2017-10-23 09:17 /var
[cloudera@quickstart Desktop]$ hdfs dfs -mkdir /char_inputdir

[cloudera@quickstart ~]$ hdfs dfs -ls /
Found 7 items
drwxrwxrwx   - hdfs     supergroup          0 2017-10-23 09:15 /benchmarks
drwxr-xr-x   - cloudera supergroup          0 2023-02-18 00:44 /char_inputdir
drwxr-xr-x   - hbase    supergroup          0 2023-02-17 23:53 /hbase
drwxr-xr-x   - solr     solr                0 2017-10-23 09:18 /solr
drwxrwxrwt   - hdfs     supergroup          0 2023-02-03 02:48 /tmp
drwxr-xr-x   - hdfs     supergroup          0 2017-10-23 09:17 /user
drwxr-xr-x   - hdfs     supergroup          0 2017-10-23 09:17 /var

[cloudera@quickstart ~]$ hdfs dfs -put /home/cloudera/Desktop/char_count.txt /char_inputdir/
[cloudera@quickstart ~]$ hdfs dfs -ls /char_inputdir
Found 1 items
-rw-r--r--   1 cloudera supergroup         92 2023-02-18 00:53 /char_inputdir/char_count.txt

[cloudera@quickstart ~]$ hdfs dfs -cat /char_inputdir/char_count.txt
Hii, myself Siddhesh.
I am studying in RJ College
I am a Data Science Student in RJ College

[cloudera@quickstart ~]$ hadoop jar /home/cloudera/Desktop/CharCount.jar CharCountDriver

23/02/18 01:00:37 INFO mapreduce.Job:  map 0% reduce 0%
23/02/18 01:00:58 INFO mapreduce.Job:  map 50% reduce 0%
23/02/18 01:00:59 INFO mapreduce.Job:  map 100% reduce 0%
23/02/18 01:01:15 INFO mapreduce.Job:  map 100% reduce 100%
23/02/18 01:01:16 INFO mapreduce.Job: Job job_1676706772828_0001 completed
successfully
23/02/18 01:01:16 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=364
                FILE: Number of bytes written=431890
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
```

FILE: Number of write operations=0
HDFS: Number of bytes read=362
HDFS: Number of bytes written=108
HDFS: Number of read operations=9
HDFS: Number of large read operations=0
HDFS: Number of write operations=2
Job Counters
Launched map tasks=2
Launched reduce tasks=1
Data-local map tasks=2
Total time spent by all maps in occupied slots (ms)=37871
Total time spent by all reduces in occupied slots (ms)=14386
Total time spent by all map tasks (ms)=37871
Total time spent by all reduce tasks (ms)=14386
Total vcore-milliseconds taken by all map tasks=37871
Total vcore-milliseconds taken by all reduce tasks=14386
Total megabyte-milliseconds taken by all map tasks=38779904
Total megabyte-milliseconds taken by all reduce tasks=14731264
Map-Reduce Framework
Map input records=3
Map output records=92
Map output bytes=549
Map output materialized bytes=370
Input split bytes=224
Combine input records=92
Combine output records=45
Reduce input groups=27
Reduce shuffle bytes=370
Reduce input records=45
Reduce output records=27
Spilled Records=90
Shuffled Maps =2
Failed Shuffles=0
Merged Map outputs=2
GC time elapsed (ms)=514
CPU time spent (ms)=2340
Physical memory (bytes) snapshot=640139264
Virtual memory (bytes) snapshot=4519460864
Total committed heap usage (bytes)=527638528
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=138
	File Output Format Counters
		Bytes Written=108
```

```
[cloudera@quickstart ~]$ hdfs dfs -ls /
Found 8 items
drwxrwxrwx   - hdfs     supergroup          0 2017-10-23 09:15 /benchmarks
drwxr-xr-x   - cloudera supergroup          0 2023-02-18 00:53 /char_inputdir
drwxr-xr-x   - cloudera supergroup          0 2023-02-18 01:01 /char_outputdir
drwxr-xr-x   - hbase    supergroup          0 2023-02-17 23:53 /hbase
drwxr-xr-x   - solr     solr                0 2017-10-23 09:18 /solr
drwxrwxrwt   - hdfs     supergroup          0 2023-02-03 02:48 /tmp
drwxr-xr-x   - hdfs     supergroup          0 2017-10-23 09:17 /user
drwxr-xr-x   - hdfs     supergroup          0 2017-10-23 09:17 /var
```

```
[cloudera@quickstart ~]$ hdfs dfs -ls /char_outputdir
Found 2 items
-rw-r--r--   1 cloudera supergroup          0 2023-02-18 01:01 /char_outputdir/_SUCCESS
-rw-r--r--   1 cloudera supergroup        108 2023-02-18 01:01 /char_outputdir/part-00000
```

Output:

```
[cloudera@quickstart ~]$ hdfs dfs -cat /char_outputdir/part-00000
```

```
	3
	15
,	1
.	1
C	2
D	1
H	1
I	2
J	2
R	2
S	3
a	5
c	2
d	4
e	9
f	1
g	3
h	2
```

i	**7**
l	**5**
m	**3**
n	**5**
o	**2**
s	**3**
t	**4**
u	**2**
y	**2**