Documentation of Map Reduce

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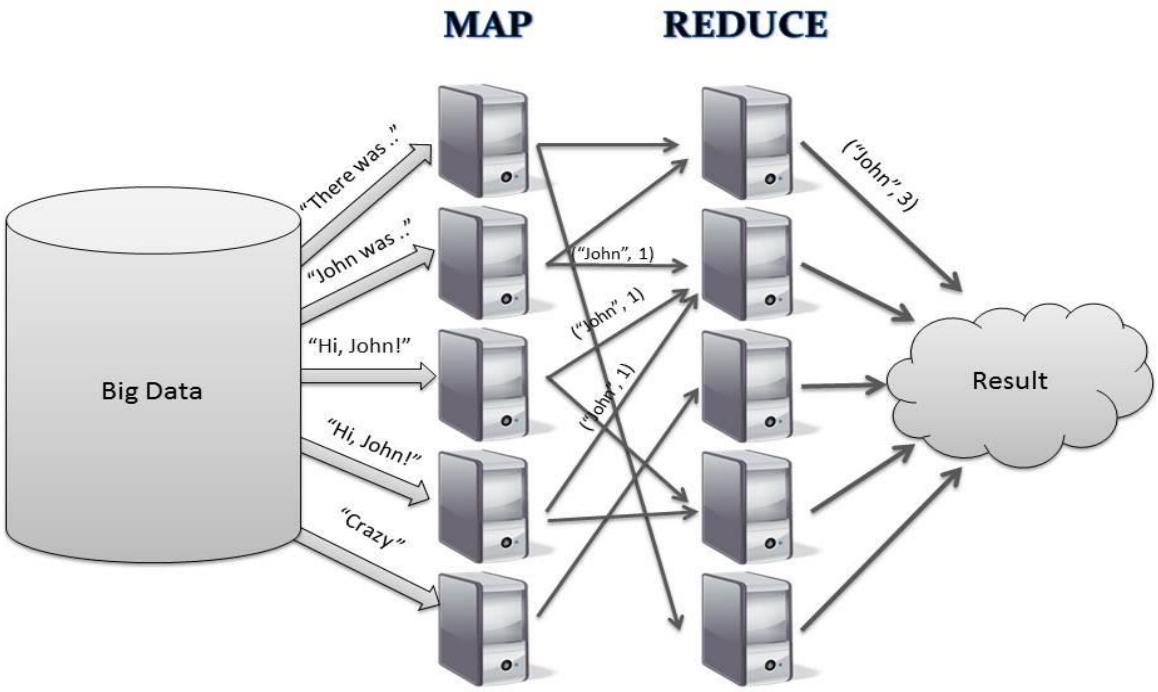
Abstract:

MapReduce is a processing technique and a program model for distributed computing based on java. The MapReduce algorithm contains two important tasks, namely Map and Reduce. Map takes a set of data and converts it into another set of data, where individual elements are broken down into tuples (key/value pairs). Secondly, reduce task, which takes the output from a map as an input and combines those data tuples into a smaller set of tuples. As the sequence of the name MapReduce implies, the reduce task is always performed after the map job.



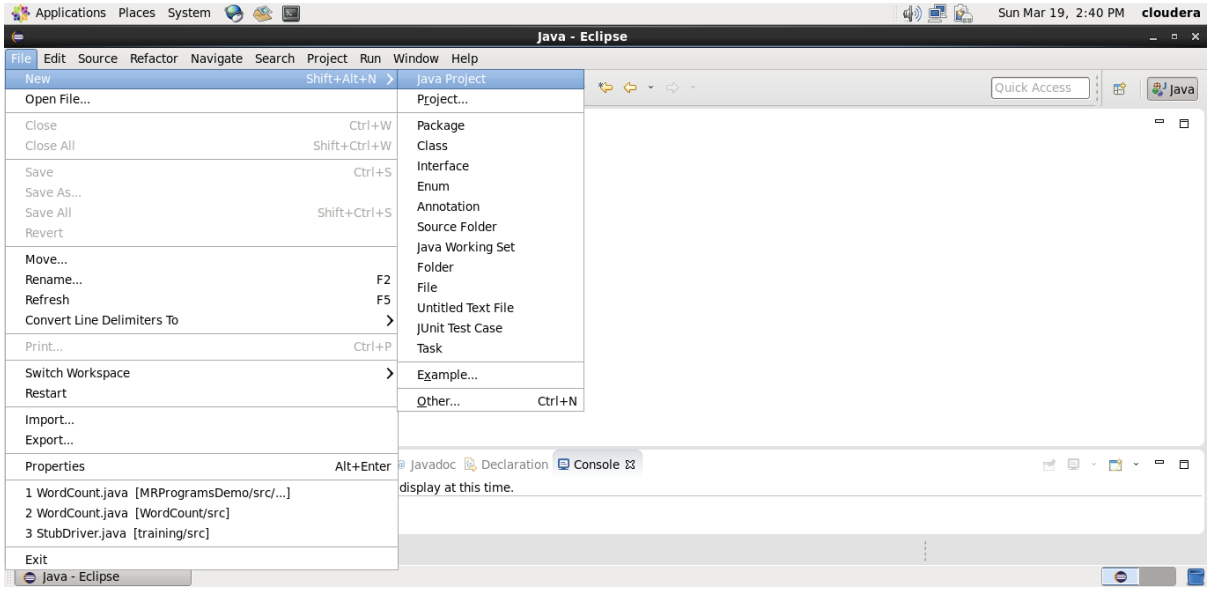
- **Map stage** : The map or mapper's job is to process the input data. Generally the input data is in the form of file or directory and is stored in the Hadoop file system (HDFS). The input file is passed to the mapper function line by line. The mapper processes the data and creates several small chunks of data.

- **Reduce stage** : This stage is the combination of the **Shuffle** stage and the **Reduce** stage. The Reducer's job is to process the data that comes from the mapper. After processing, it produces a new set of output, which will be stored in the HDFS.

Creating WordCount.jar and exporting it:-

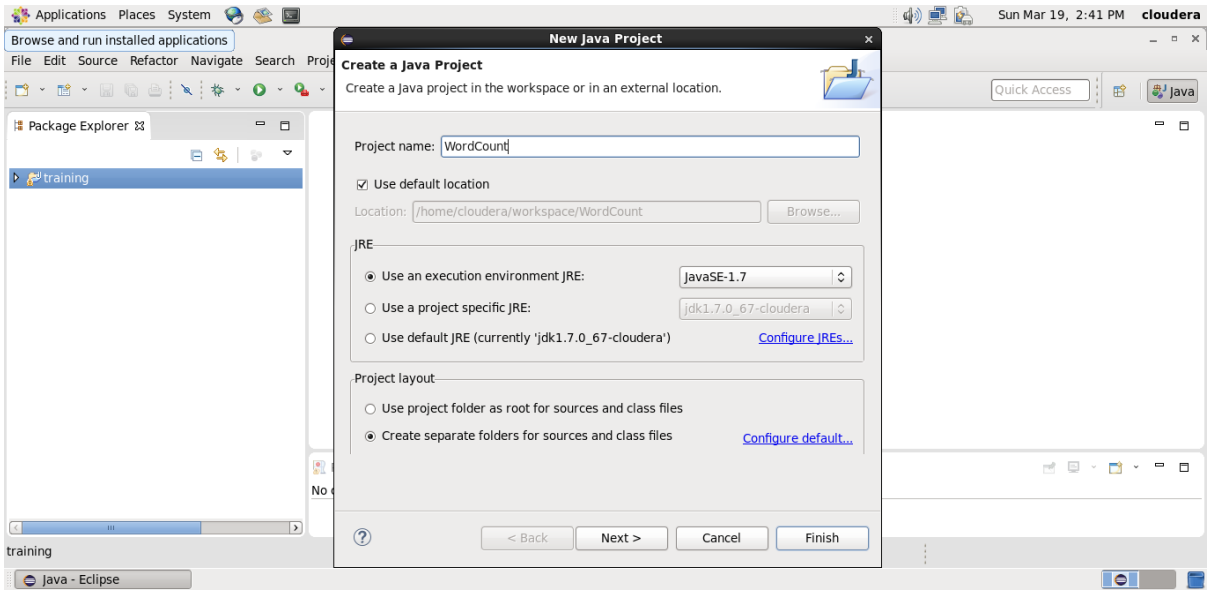
Step 1:

Open Eclipse and Click on File > New > Java Project .



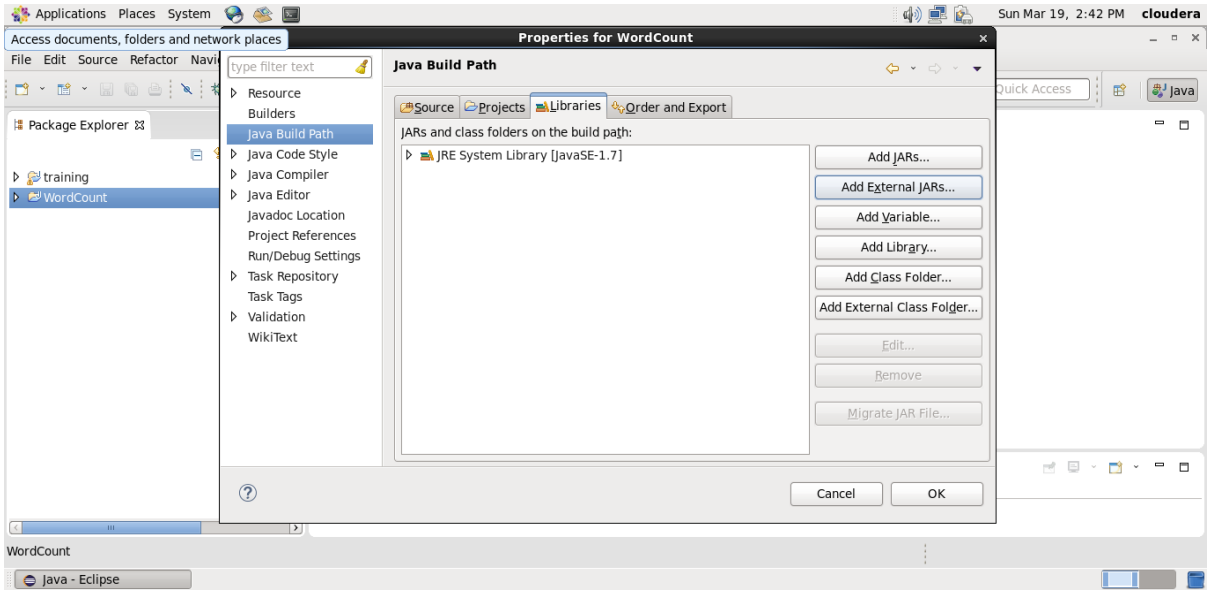
Step 2 :

Give the name ‘WordCount’ as your project name and click ‘Finish’.



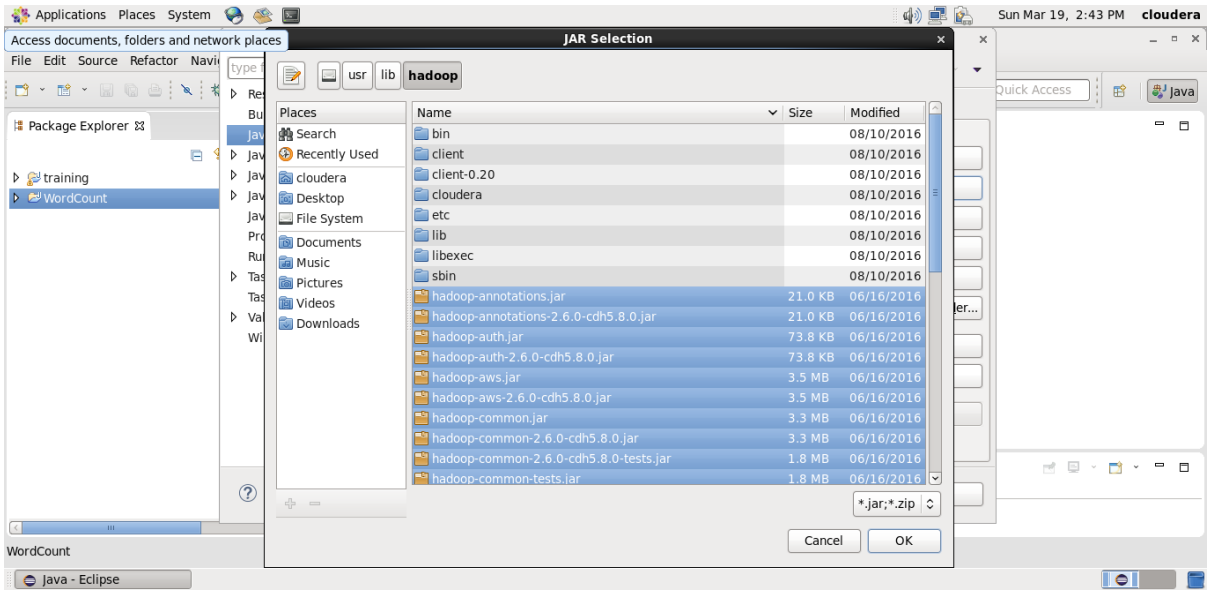
Step 3:

Right click on WordCount project and select ‘Properties’. Click ‘Java Build Path’ and switch to Libraries tab and click on ‘Add external JARs’.



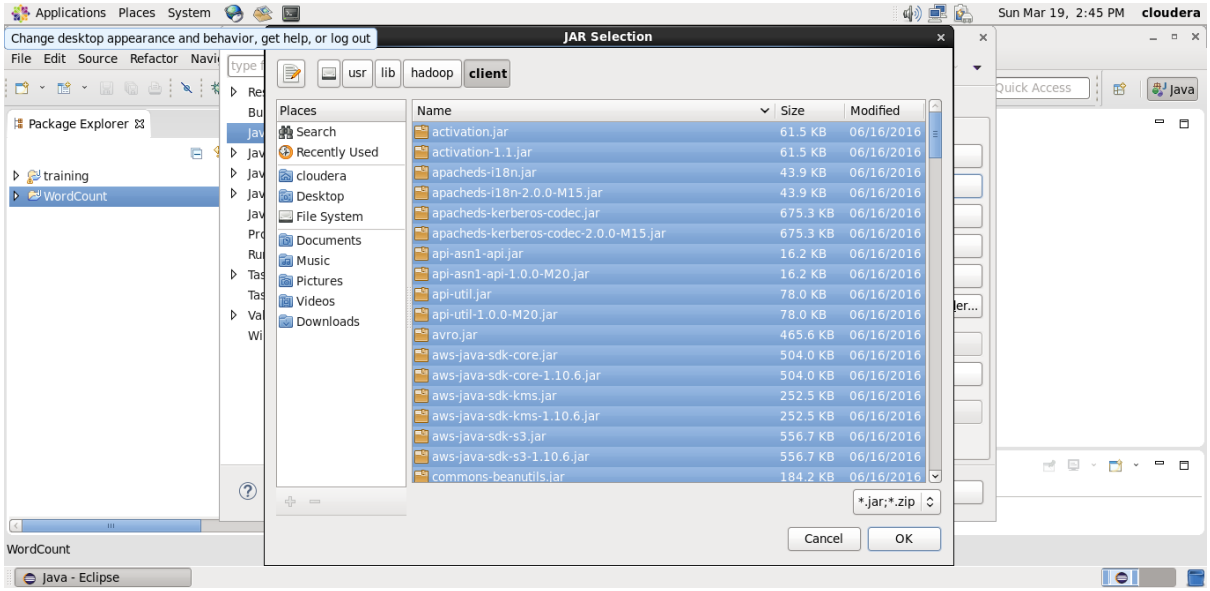
Step 4:

Select all the JAR files in usr >> lib >> hadoop directory to add them.



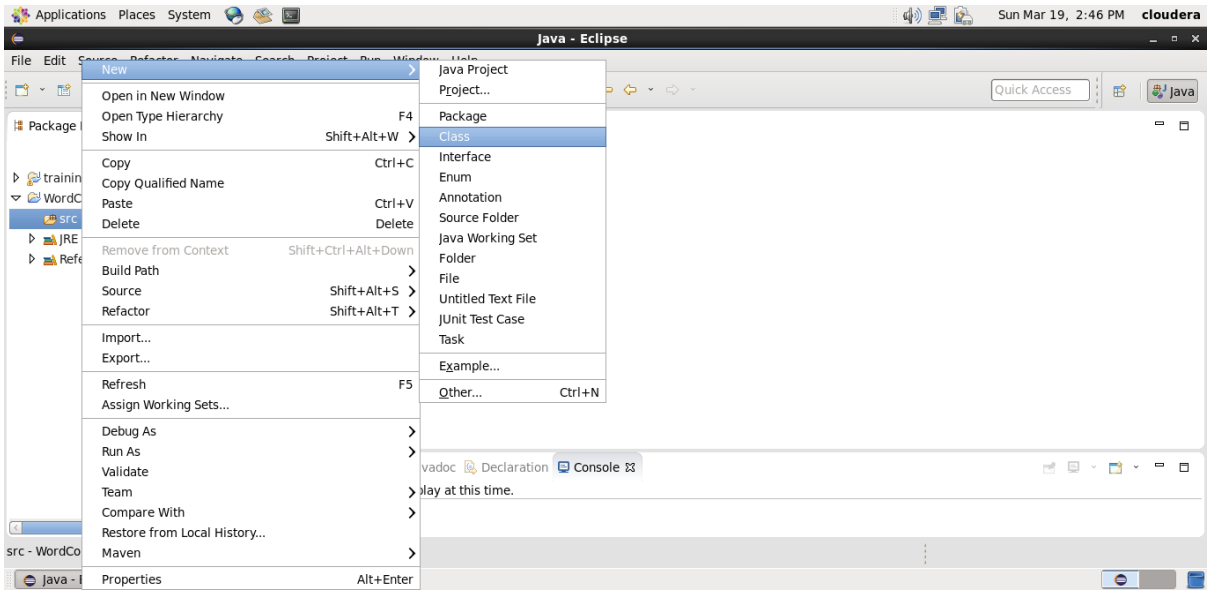
Step 5:

Again add all jar files in usr >> lib >> hadoop >> client directory and press OK.



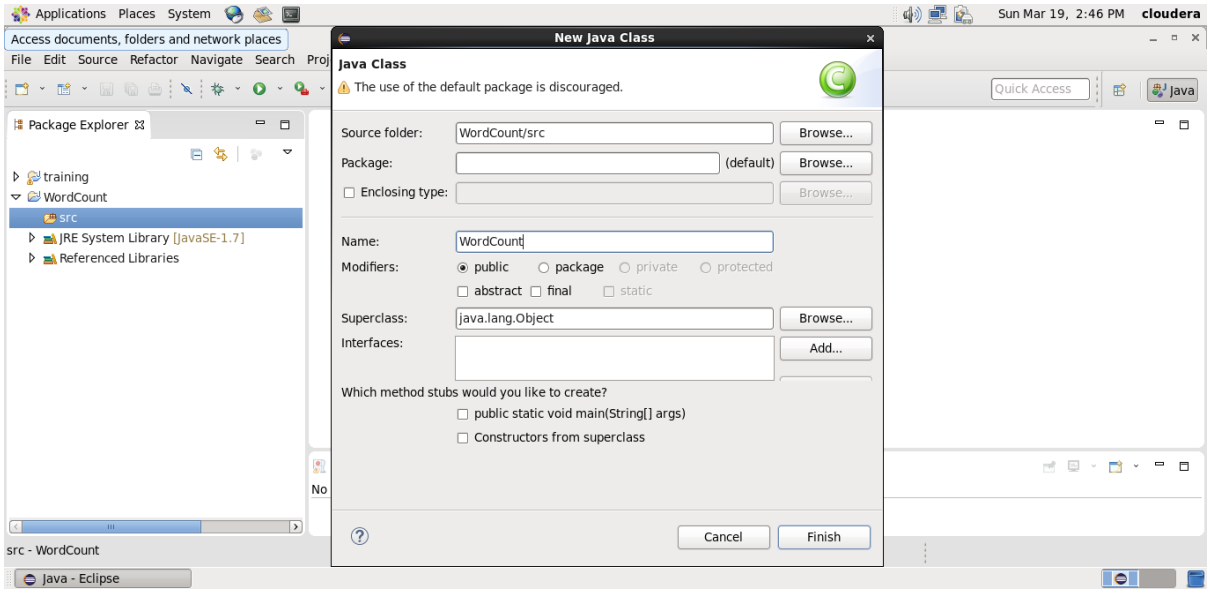
Step 6:

Right click on src, New >>Class.



Step 7:

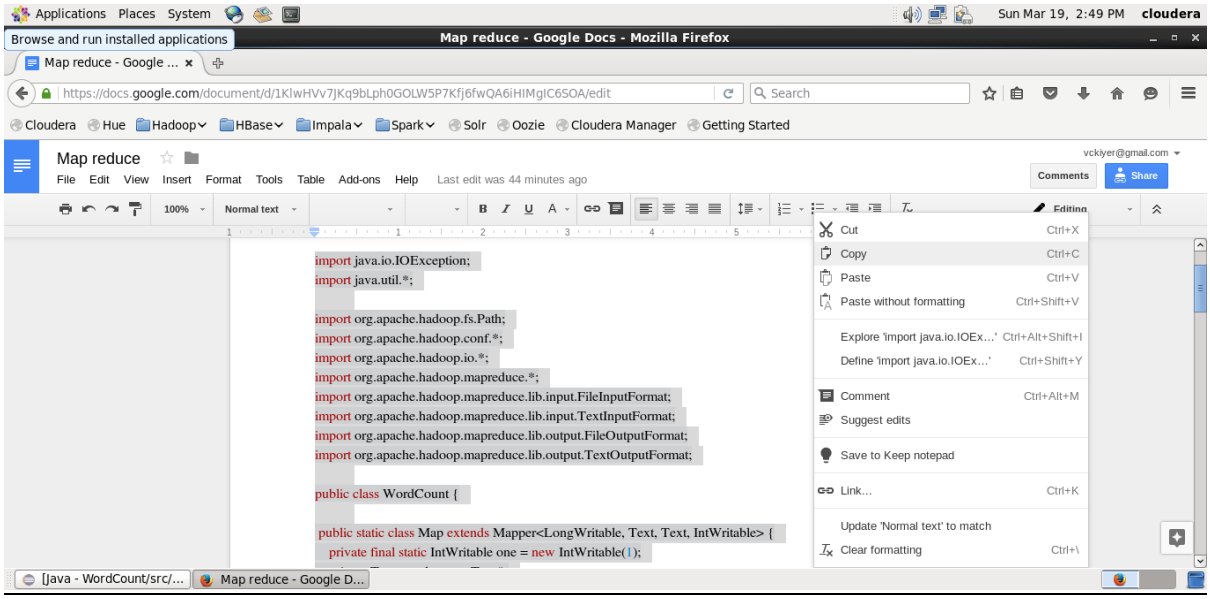
Enter the project name as ‘WordCount’ and click ‘Finish’.



Step 8:

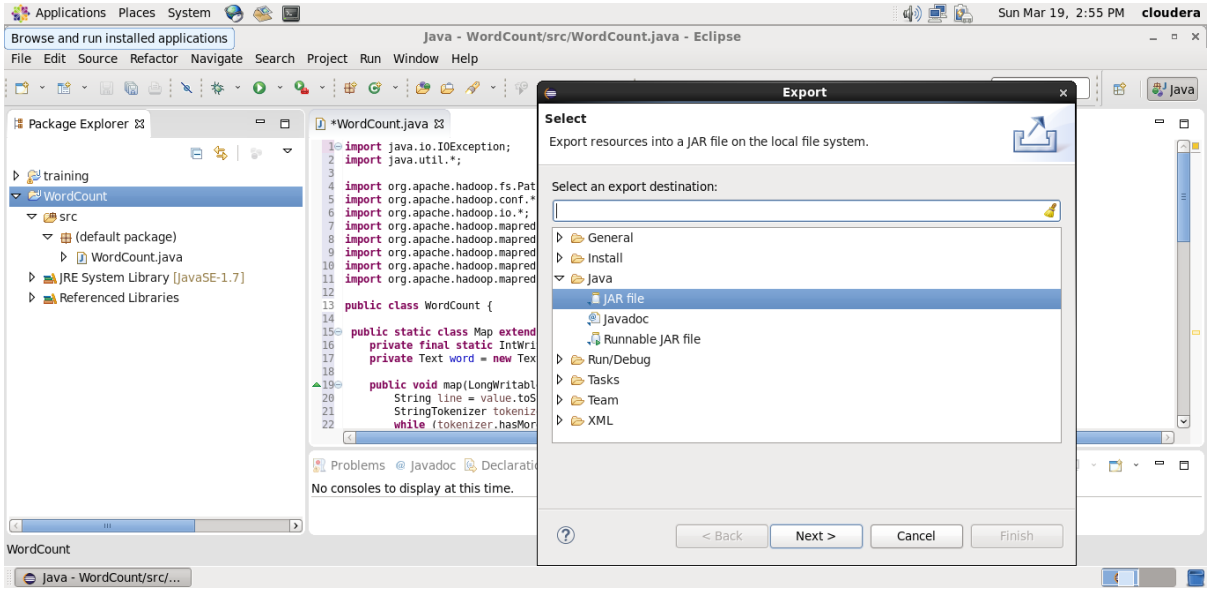
Open browser and copy and paste the Java Source code of map reduce program from the link given.

URL:
https://docs.google.com/document/d/1KlwHVv7JKq9bLph0GOLW5P7Kfj6fwQA6iHIMgIC6SOA/edit?usp=sharing



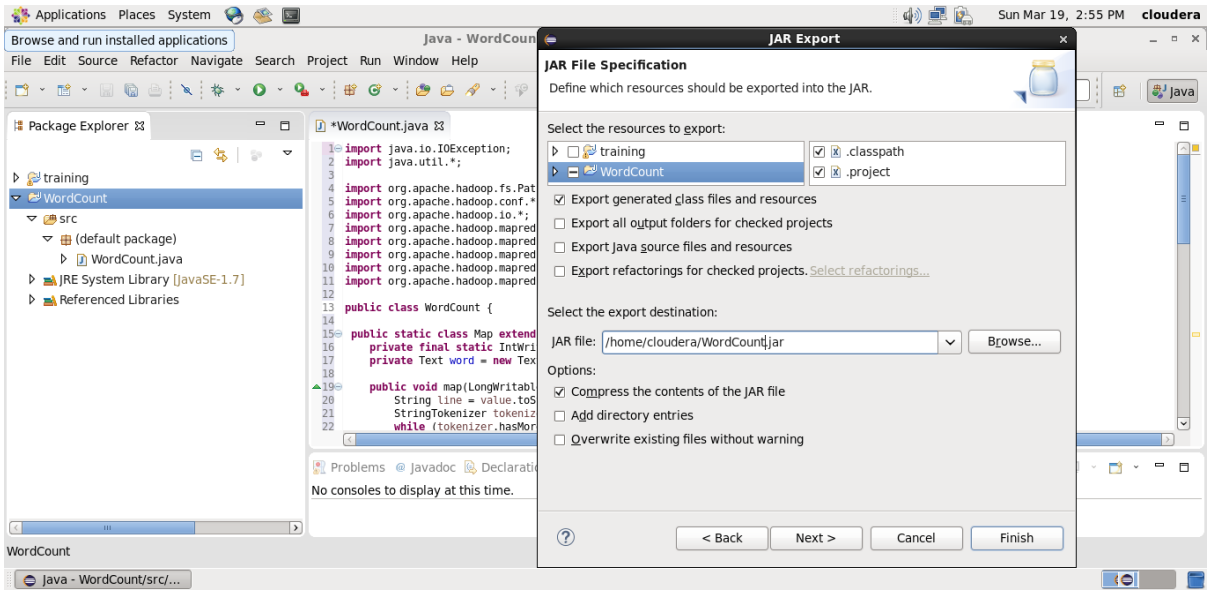
Step 9:

Right click on the WordCount project and select Export >> Java >> JAR file. Then click on ‘Next’.



Step 10:

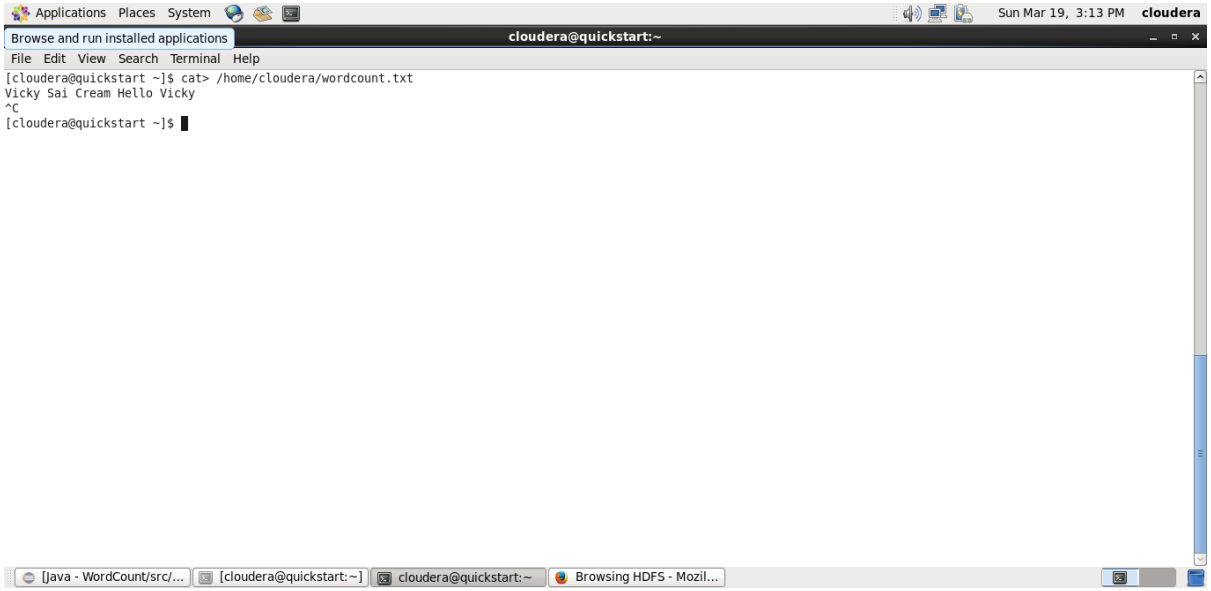
Name the JAR file and click ‘Finish’.



Creating a text file for Mapreduce job to work on:

Step 11: Open a new terminal and create a normal text file .

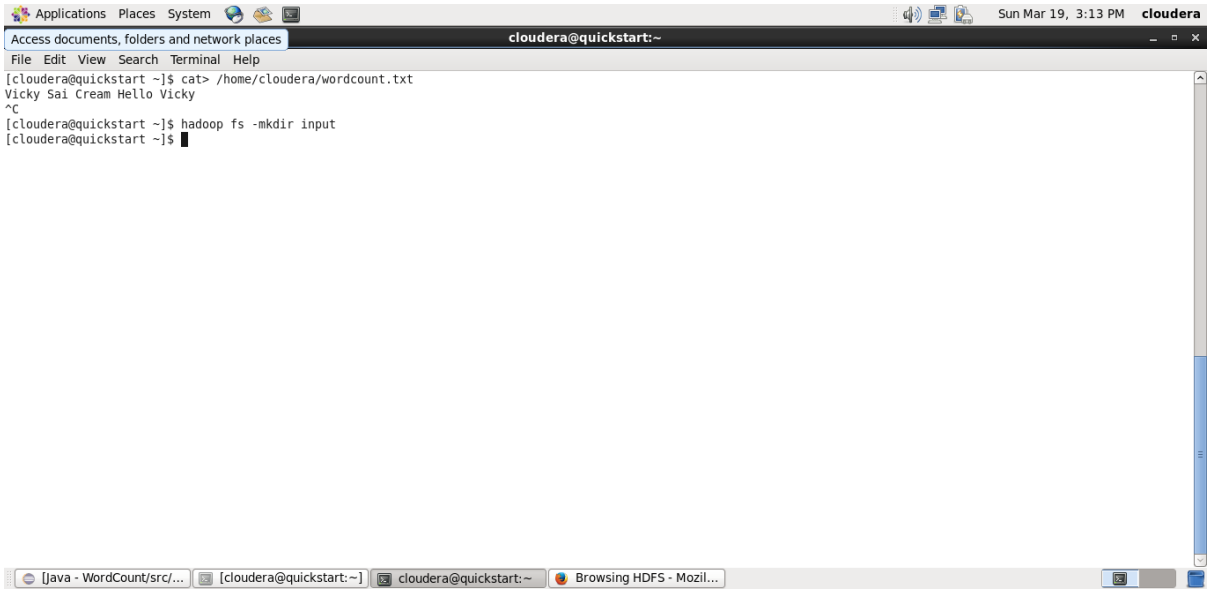
Command: cat> /home/cloudera/wordcount.txt



Step 12:

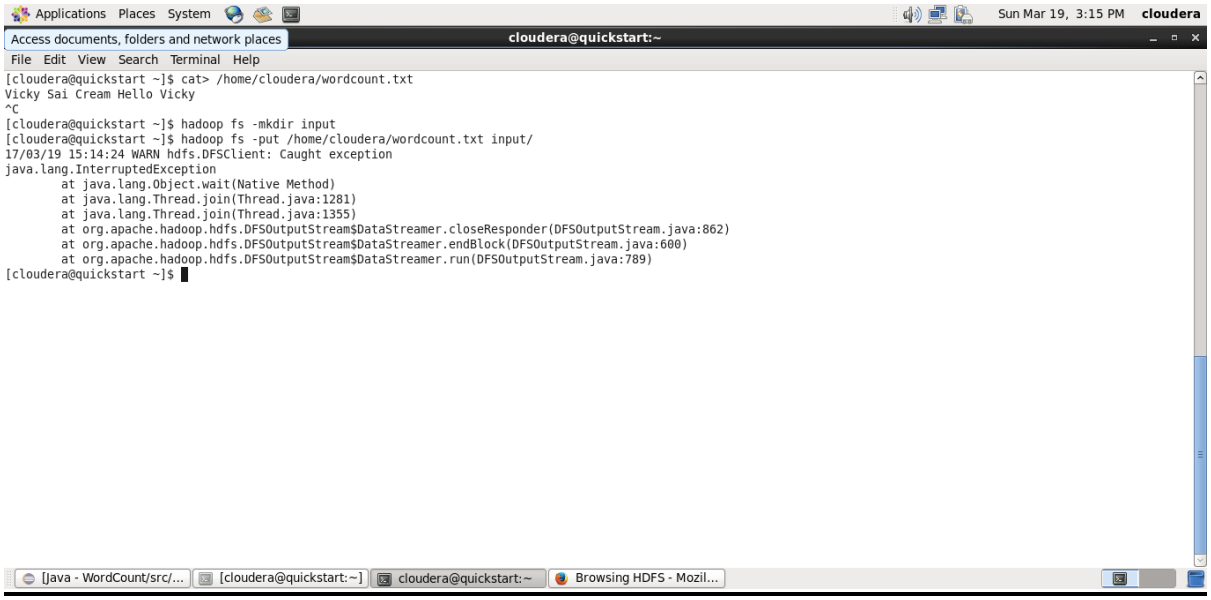
Make a new Directory using the following command.

Command: hadoop fs -mkdir input



Step 13: Copy the created text file to the new directory created in HDFS.

Command: hadoop fs -put /home/cloudera/wordcount.txt input/

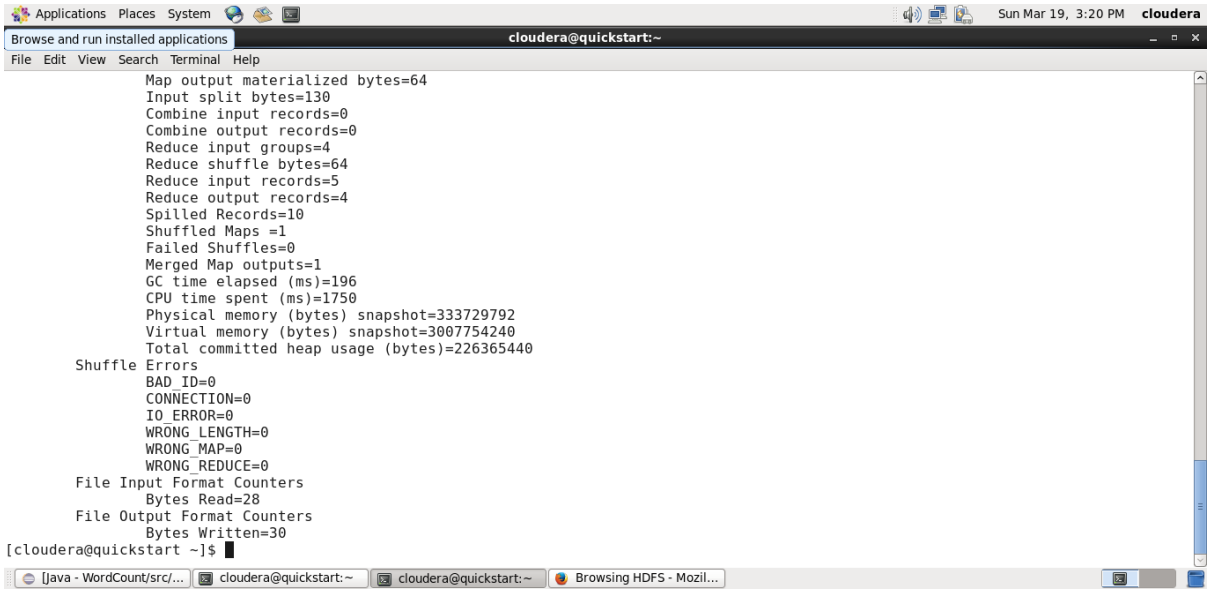


Initializing mapreduce job:

Step 14:

Initialize the mapreduce job by giving the following command and wait for sometime.

Command: hadoop jar /home/cloudera/WordCount.jar WordCount input/wordcount.txt output



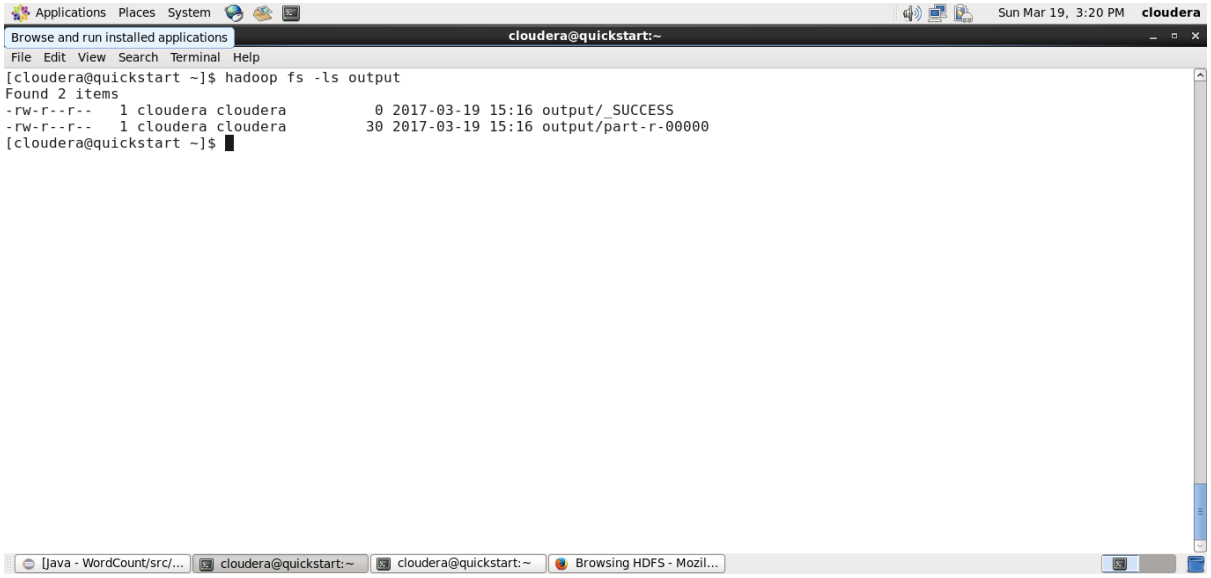
Now wait for about 50-70 seconds while the mapreduce job is being performed for the data created earlier.

Output mapreduce job:

Step 15:

The output directory of the mapreduce program is listed using the following command.

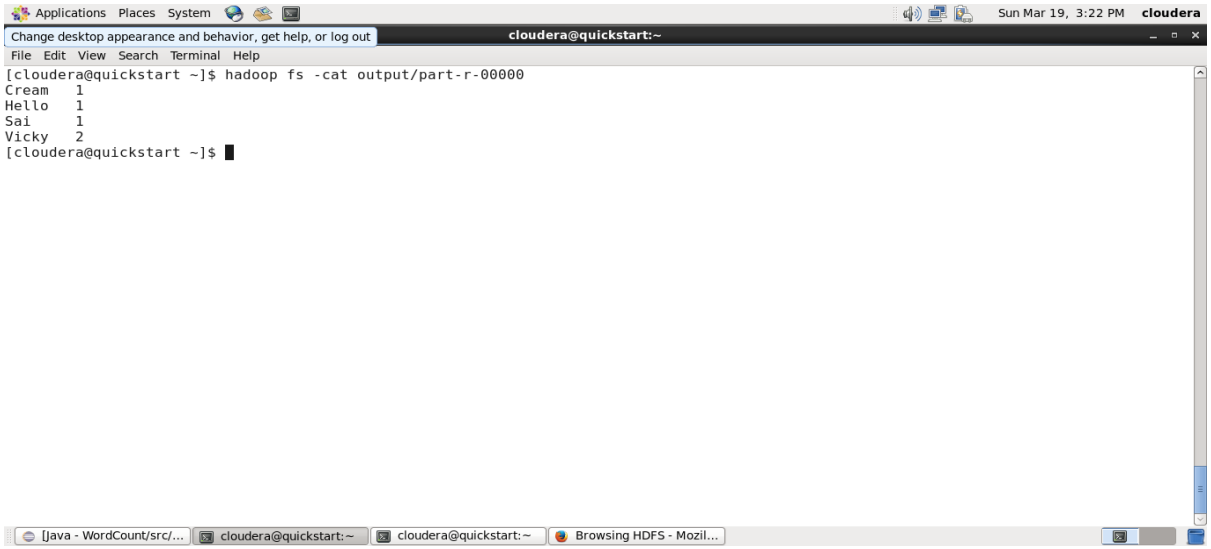
Command: hadoop fs -ls output



Step 16:

The final output of the mapreduce program is found using the following command.

Command: hadoop fs -cat output/part-r-00000



Conclusion:

Thus the map reduce job was successfully applied for a particular data and the number of times a word is repeated is identified.