Exp No: 2

Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm

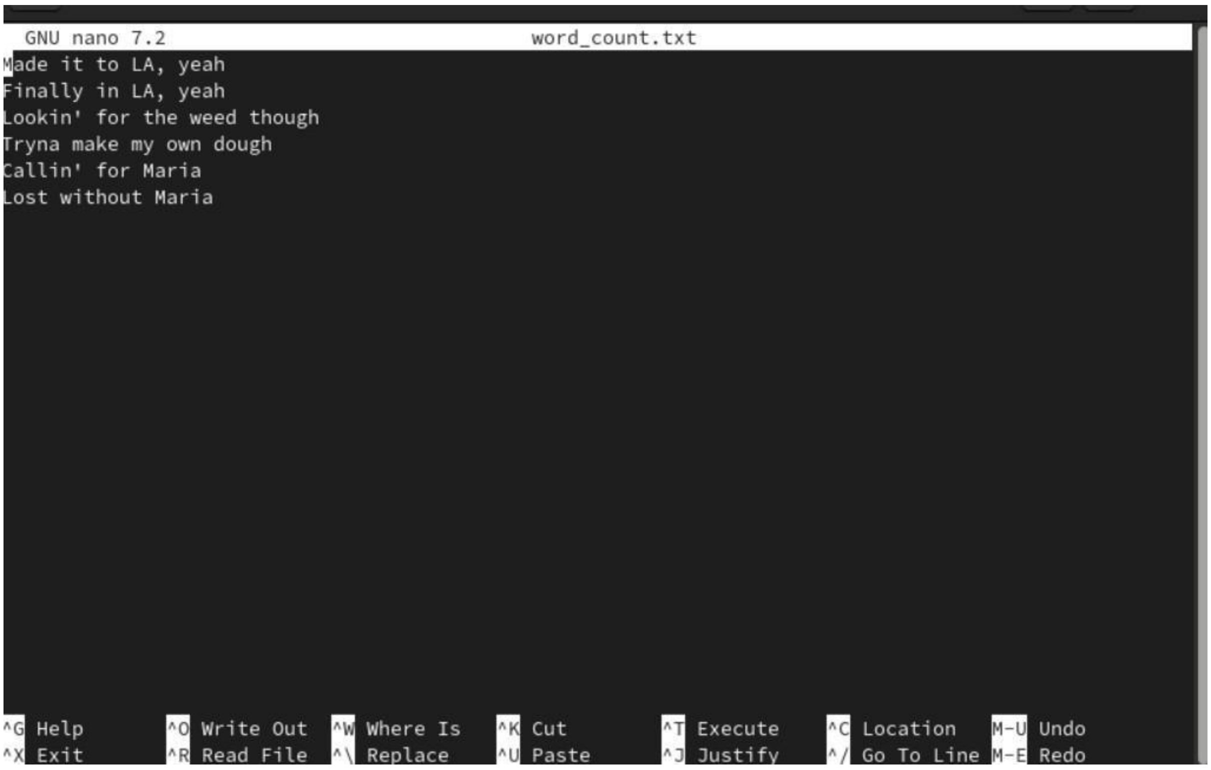
Aim:

To Run a basic Word Count MapReduce program to understand Map Reduce Paradigm.

Procedure:

Step 1: Create Data File:

Create a file named "word_count_data.txt" and populate it with text data that you wish to analyze. Login with your Hadoop user.



```
  GNU nano 7.2                          word_count.txt
Made it to LA, yeah
Finally in LA, yeah
Lookin' for the weed though
Tryna make my own dough
Callin' for Maria
Lost without Maria
```

Step 2: Mapper Logic - mapper.py:

Create a file named "mapper.py" to implement the logic for the mapper. The mapper will read input data from STDIN, split lines into words, and output each word with its count.

nano mapper.py

# Copy and paste the mapper.py code

#!/usr/bin/env python3

# import sys because we need to read and write data to STDIN and STDOUT

```
#!/usr/bin/python3
import sys for line
in sys.stdin:
        line = line.strip()
         # remove leading and trailing whitespace words
        = line.split()
```

```
            # split the line into words for word in words: nano
            word_count.txt print( '%s\t%s' % (word, 1)) Step
            3: Reducer Logic - reducer.py:
```

Create a file named "reducer.py" to implement the logic for the reducer. The reducer will aggregate the occurrences of each word and generate the final output.

nano reducer.py

# Copy and paste the reducer.py code reducer.py

```
#!/usr/bin/python3            from
operator    import    itemgetter
import   sys   current_word   =
None current_count = 0 word =
None for line in sys.stdin: line
= line.strip()
            word, count = line.split('\t', 1) try:
                        count = int(count)
            except ValueError: continue
            if current_word == word:
                        current_count += count else:
                        if   current_word:   print(   '%s\t%s'   %   (current_word,
                                    current_count))
                        current_count = count current_word
                        = word
if current_word == word:
            print( '%s\t%s' % (current_word, current_count))
```

Step 4: Prepare Hadoop Environment:

Start the Hadoop daemons and create a directory in HDFS to store your data. start-all.sh

```
hdfsdfs -mkdir /word_count_in_python
```

```
hdfsdfs -copyFromLocal /path/to/word_count.txt/word_count_in_python
```

Step 5: Make Python Files Executable:

Give executable permissions to your mapper.py and reducer.py files.

```
chmod 777 mapper.py reducer.py
```

Step 6: Run Word Count using Hadoop Streaming:

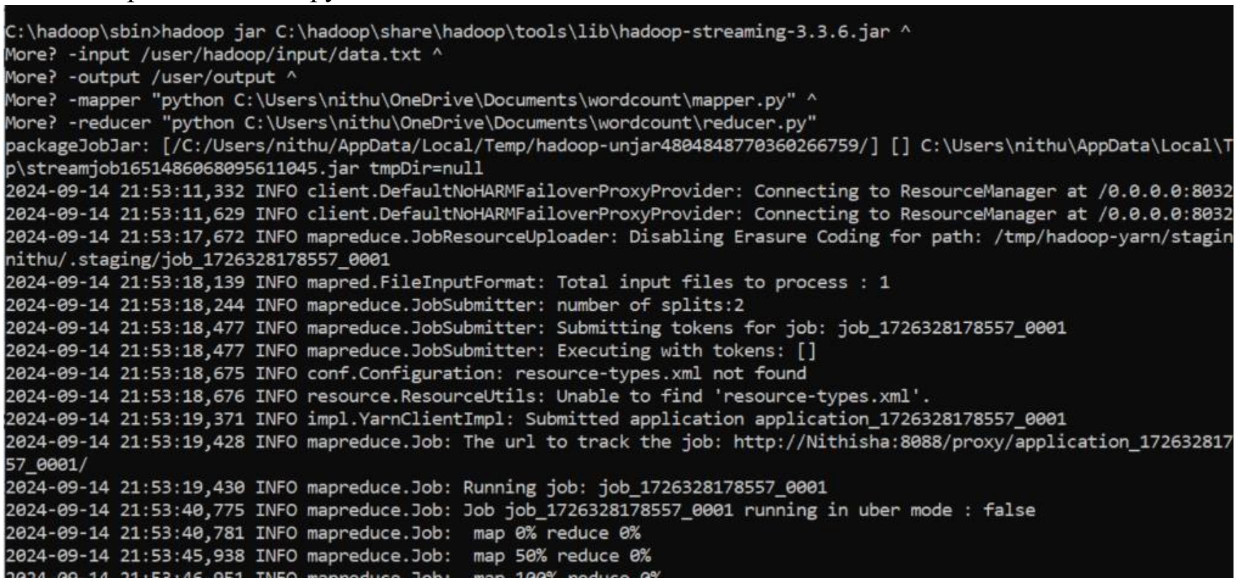
Download the latest hadoop-streaming jar file and place it in a location you can easily access.

Then run the Word Count program using Hadoop Streaming.

```
hadoop jar /path/to/hadoop-streaming-3.3.6.jar \

-input /word_count_in_python/word_count_data.txt \

-output /word_count_in_python/new_output \
-mapper /path/to/mapper.py \
-reducer /path/to/reducer.py
```

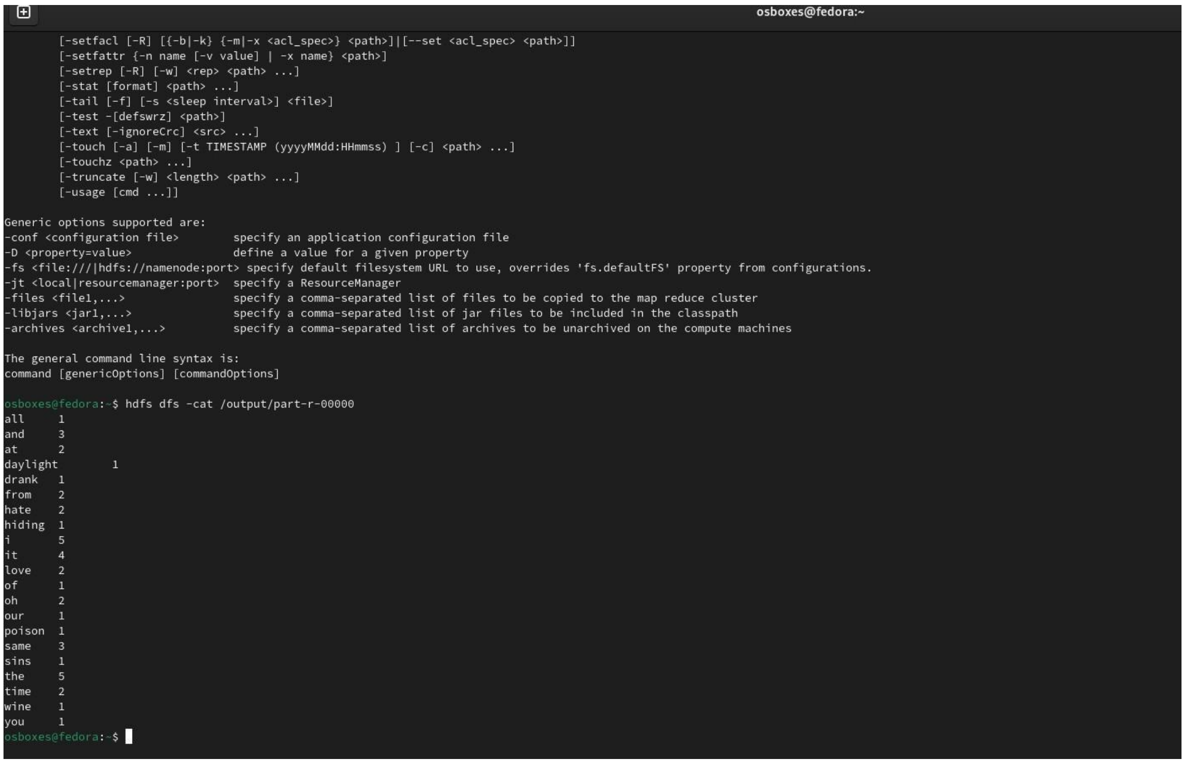


```
C:\hadoop\sbin>hadoop jar C:\hadoop\share\hadoop\tools\lib\hadoop-streaming-3.3.6.jar ^
More? -input /user/hadoop/input/data.txt ^
More? -output /user/output ^
More? -mapper "python C:\Users\nithu\OneDrive\Documents\wordcount\mapper.py" ^
More? -reducer "python C:\Users\nithu\OneDrive\Documents\wordcount\reducer.py"
packageJobJar: [/C:/Users/nithu/AppData/Local/Temp/hadoop-unjar4804848770360266759/] [] C:\Users\nithu\AppData\Local\T
p\streamjob1651486068095611045.jar tmpDir=null
2024-09-14 21:53:11,332 INFO client.DefaultNoHARMFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2024-09-14 21:53:11,629 INFO client.DefaultNoHARMFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2024-09-14 21:53:17,672 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/stagin
nithu/.staging/job_1726328178557_0001
2024-09-14 21:53:18,139 INFO mapred.FileInputFormat: Total input files to process : 1
2024-09-14 21:53:18,244 INFO mapreduce.JobSubmitter: number of splits:2
2024-09-14 21:53:18,477 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1726328178557_0001
2024-09-14 21:53:18,477 INFO mapreduce.JobSubmitter: Executing with tokens: []
2024-09-14 21:53:18,675 INFO conf.Configuration: resource-types.xml not found
2024-09-14 21:53:18,676 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2024-09-14 21:53:19,371 INFO impl.YarnClientImpl: Submitted application application_1726328178557_0001
2024-09-14 21:53:19,428 INFO mapreduce.Job: The url to track the job: http://Nithisha:8088/proxy/application_172632817
57_0001/
2024-09-14 21:53:19,430 INFO mapreduce.Job: Running job: job_1726328178557_0001
2024-09-14 21:53:40,775 INFO mapreduce.Job: Job job_1726328178557_0001 running in uber mode : false
2024-09-14 21:53:40,781 INFO mapreduce.Job:  map 0% reduce 0%
2024-09-14 21:53:45,938 INFO mapreduce.Job:  map 50% reduce 0%
2024-09-14 21:53:46,951 INFO mapreduce.Job:  map 100% reduce 0%
```

Step 8: Check Output:

Check the output of the Word Count program in the specified HDFS output directory.

hdfs dfs -cat /word_count_in_python/new_output/part-00000



```
osboxes@fedora:~
        [-setfacl [-R] [{-b|-k} {-m|-x <acl_spec>} <path>]|[--set <acl_spec> <path>]]
        [-setfattr {-n name [-v value] | -x name} <path>]
        [-setrep [-R] [-w] <rep> <path> ...]
        [-stat [format] <path> ...]
        [-tail [-f] [-s <sleep interval>] <file>]
        [-test -[defswrz] <path>]
        [-text [-ignoreCrc] <src> ...]
        [-touch [-a] [-m] [-t TIMESTAMP (yyyyMMdd:HHmmss) ] [-c] <path> ...]
        [-touchz <path> ...]
        [-truncate [-w] <length> <path> ...]
        [-usage [cmd ...]]

Generic options supported are:
-conf <configuration file>        specify an application configuration file
-D <property=value>               define a value for a given property
-fs <file:///|hdfs://namenode:port> specify default filesystem URL to use, overrides 'fs.defaultFS' property from configurations.
-jt <local|resourcemanager:port>  specify a ResourceManager
-files <file1,...>                specify a comma-separated list of files to be copied to the map reduce cluster
-libjars <jar1,...>               specify a comma-separated list of jar files to be included in the classpath
-archives <archive1,...>          specify a comma-separated list of archives to be unarchived on the compute machines

The general command line syntax is:
command [genericOptions] [commandOptions]

osboxes@fedora:~$ hdfs dfs -cat /output/part-r-00000
all     1
and     3
at      2
daylight        1
drank   1
from    2
hate    2
hiding  1
i       5
it      4
love    2
of      1
oh      2
our     1
poison  1
same    3
sins    1
the     5
time    2
wine    1
you     1
osboxes@fedora:~$ 
```

Result:

Thus, the program for basic Word Count Map Reduce has been executed successfully.