Exp No: 2

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

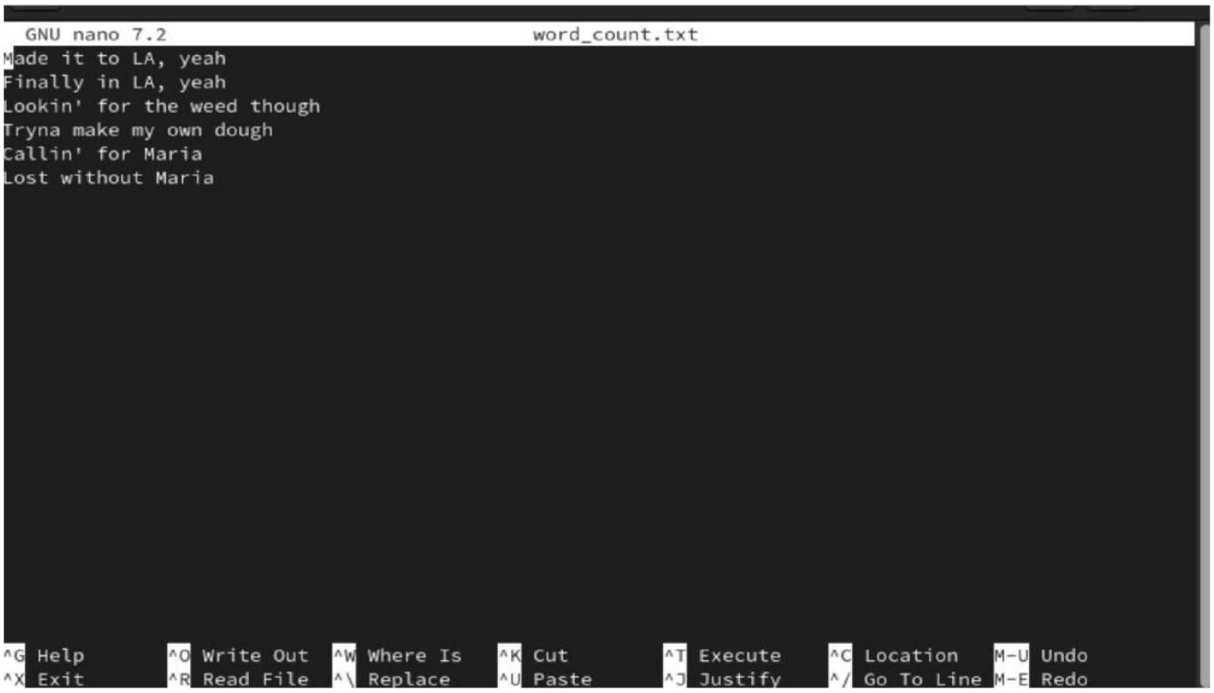
Aim:

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.

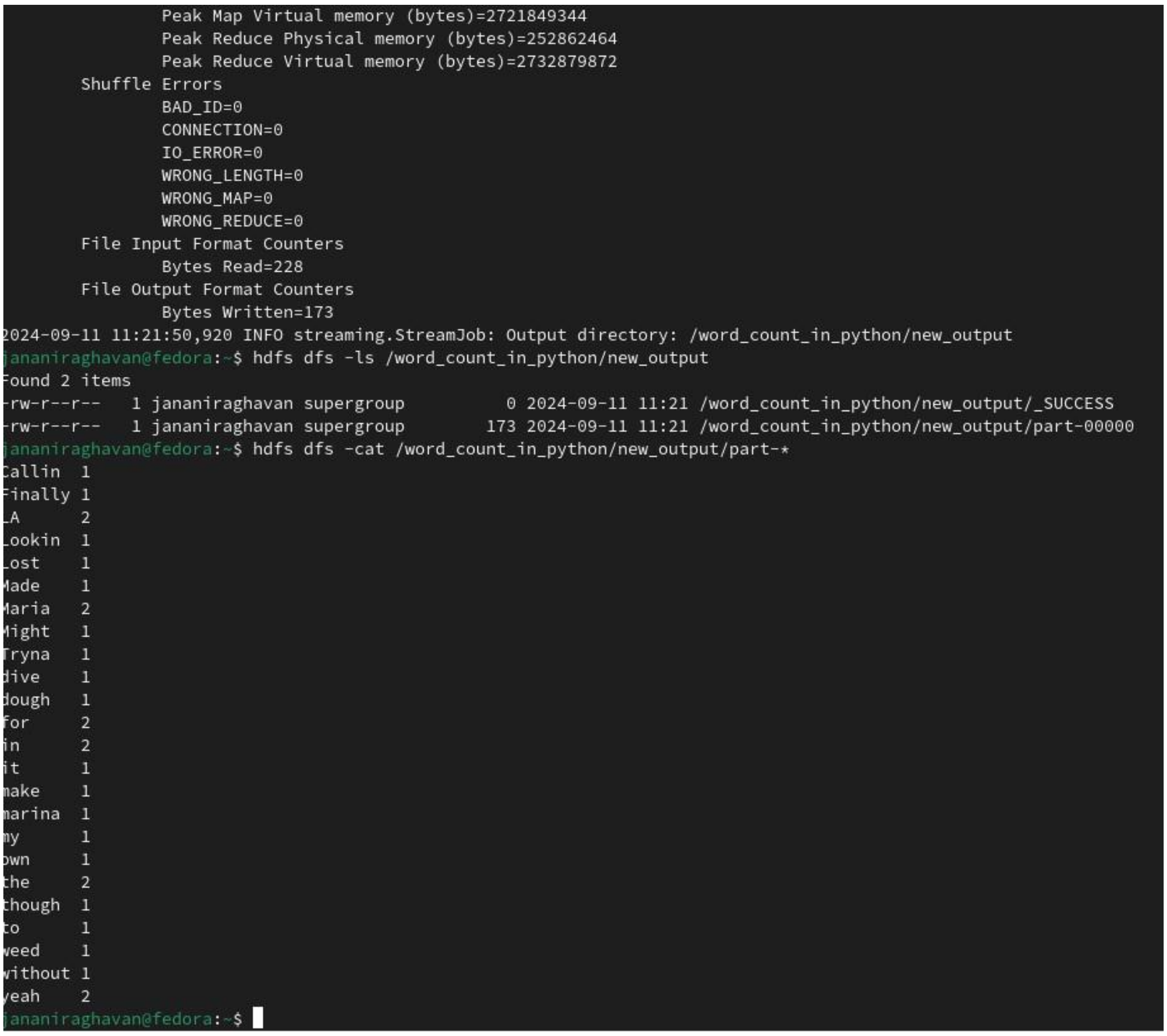
Then run the Word Count program using Hadoop Streaming.

```
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
```

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
```


```
                Peak Map Virtual memory (bytes)=2721849344
                Peak Reduce Physical memory (bytes)=252862464
                Peak Reduce Virtual memory (bytes)=2732879872
        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=228
        File Output Format Counters
                Bytes Written=173
2024-09-11 11:21:50,920 INFO streaming.StreamJob: Output directory: /word_count_in_python/new_output
jananiraghavan@fedora:~$ hdfs dfs -ls /word_count_in_python/new_output
Found 2 items
-rw-r--r--   1 jananiraghavan supergroup          0 2024-09-11 11:21 /word_count_in_python/new_output/_SUCCESS
-rw-r--r--   1 jananiraghavan supergroup        173 2024-09-11 11:21 /word_count_in_python/new_output/part-00000
jananiraghavan@fedora:~$ hdfs dfs -cat /word_count_in_python/new_output/part-*
Callin  1
Finally 1
LA      2
Lookin  1
Lost    1
Made    1
Maria   2
Might   1
Tryna   1
dive    1
dough   1
for     2
in      2
it      1
make    1
marina  1
my      1
own     1
the     2
though  1
to      1
weed    1
without 1
yeah    2
jananiraghavan@fedora:~$ 
```

Result:

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