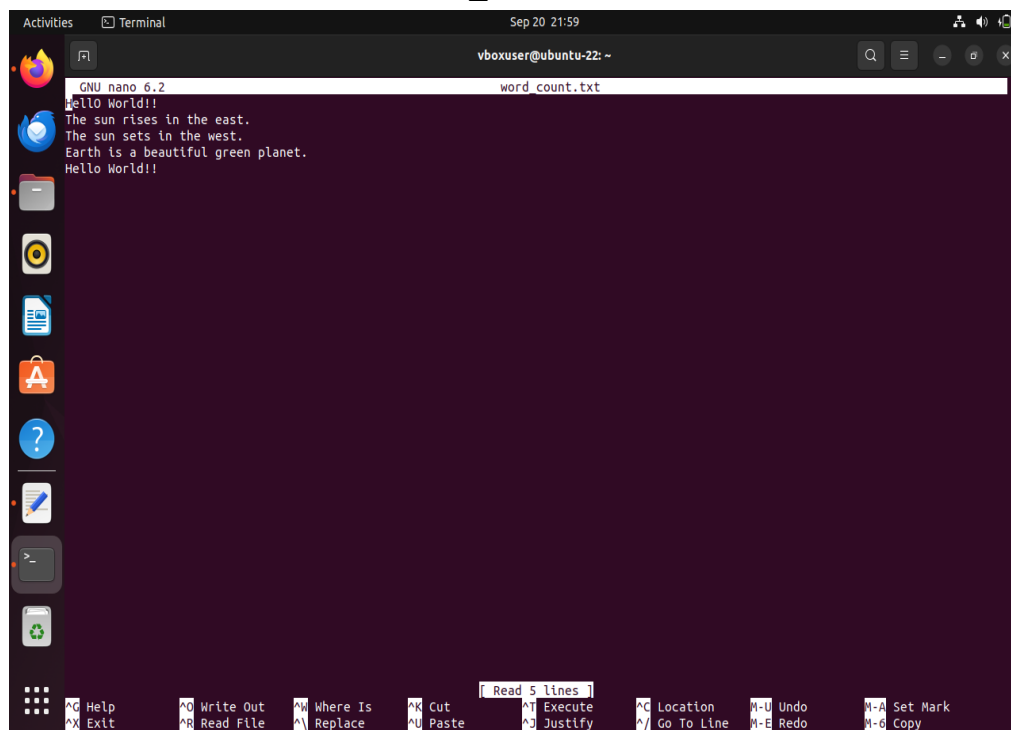


Exp.No: 2**Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm****AIM:**

To run a basic Word Count MapReduce program.

PROCEDURE:

Step 1: Create Data File: Create a file named "word_count_data.txt" and populate it with text data that you wish to analyse. Login with your hadoop user.

nano word_count.txt

```
GNU nano 6.2 word_count.txt
Hello World!!
The sun rises in the east.
The sun sets in the west.
Earth is a beautiful green planet.
Hello World!!
```

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

```

GNU nano 6.2 mapper.py
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:
        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

```

GNU nano 6.2 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
```

```
hdfs dfs -mkdir /word_count_in_python
```

```
hdfs dfs -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.

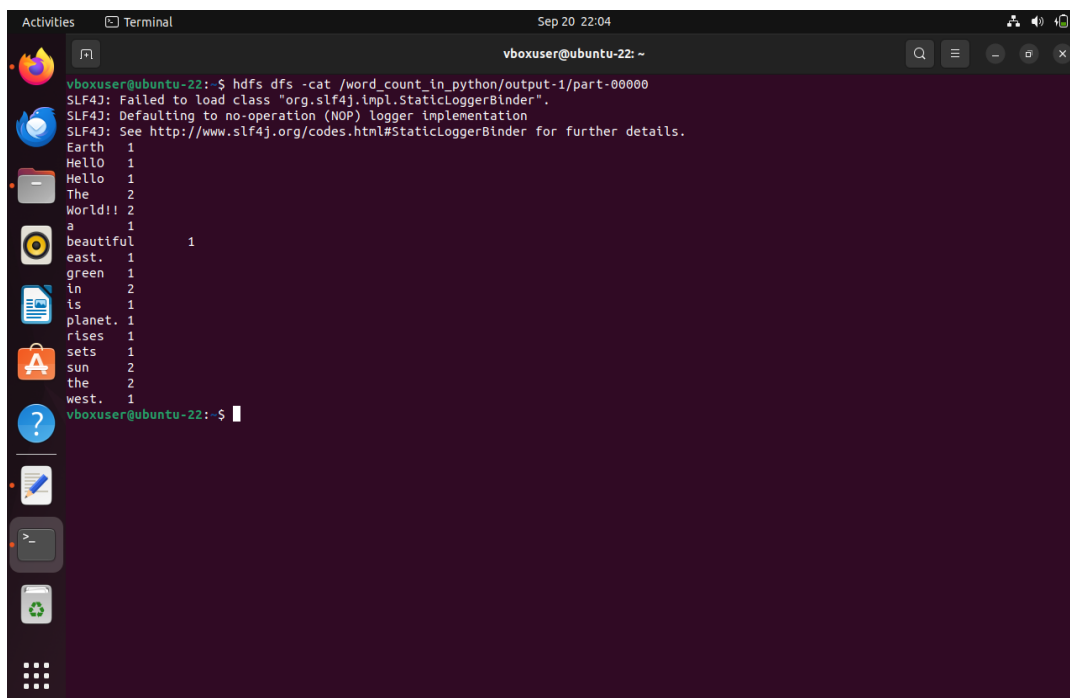
```
hadoop jar /path/to/hadoop-streaming-3.3.6.jar \ -input
```

```
/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 7: Check Output: Check the output of the Word Count program in the specified HDFS output directory.

```
hdfs dfs -cat /word_count_in_python/output-1/part-00000
```



The screenshot shows a terminal window with the following output:

```
Activities Terminal Sep 20 22:04  
vboxuser@ubuntu-22: ~  
vboxuser@ubuntu-22:~$ hdfs dfs -cat /word_count_in_python/output-1/part-00000  
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".  
SLF4J: Defaulting to no-operation (NOP) logger implementation  
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.  
Earth 1  
Hello 1  
Hello 1  
The 2  
World!! 2  
a 1  
beautiful 1  
east. 1  
green 1  
in 2  
is 1  
planet. 1  
rises 1  
sets 1  
sun 2  
the 2  
west. 1  
vboxuser@ubuntu-22:~$
```

Step-8: Check the Output in the browser.

localhost:9870/explorer.html#/word_count_in_python/output-1

Block ID: 1073741871
Block Pool ID: BP-305058674-127.0.1.1-1726117174333
Generation Stamp: 1047
Size: 127
Availability:

- ubuntu-22.4.myguest.virtualbox.org

File contents

Earth	1
Hello	1
Hello	1
The	2
World!!	2
a	1
beautiful	1
east.	1
green	1
in	2
is	1
planet.	1
rises	1
sets	1
sun	2
the	2
west.	1

RESULT:

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