EXP 2: **Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.**

AIM:

To run a basic Word Count MapReduce program.

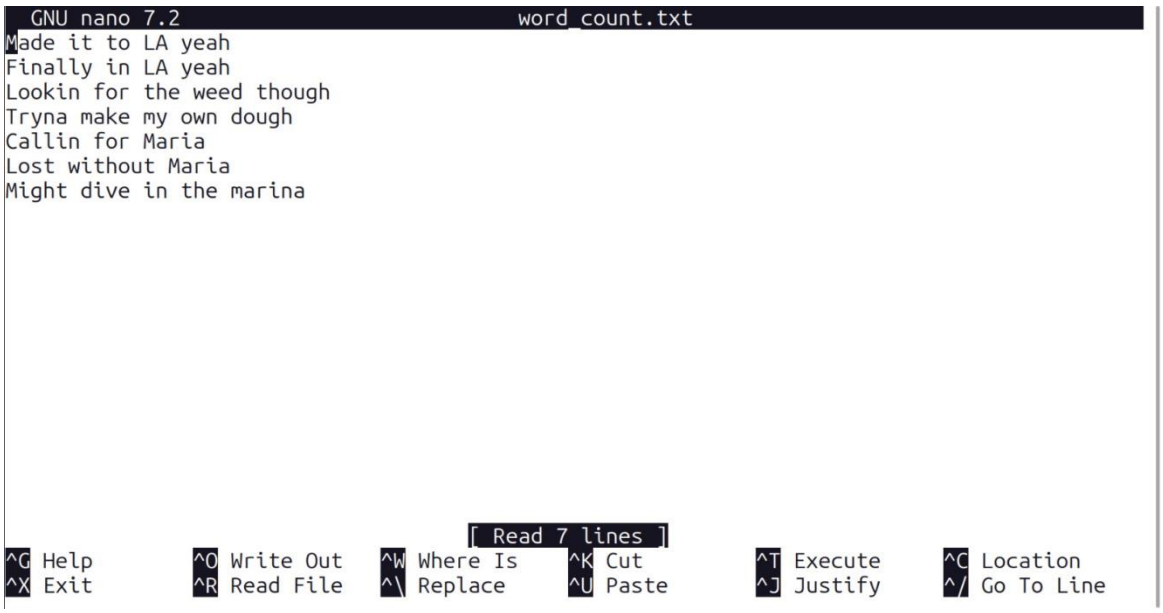
Procedure:

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
```

Output: Type the below content in word_count.txt



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:
```

```
print( '%s\t%s' % (word, 1))
```

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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 6: Make Python Files Executable:

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

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

Step 7: 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
```

```
hadoop@sanjay-VirtualBox:~/wordcount$ hadoop jar /home/hadoop/Documents/hadoop-streaming-3.3.6.jar     -inpu
t /word_count_in_python/word_count.txt     -output /word_count_in_python/output     -mapper mapper.py     -r
educer reducer.py
2023-10-25 22:54:51,391 INFO impl.MetricsConfig: Loaded properties from hadoop-metrics2.properties
2023-10-25 22:54:51,526 INFO impl.MetricsSystemImpl: Scheduled Metric snapshot period at 10 second(s).
2023-10-25 22:54:51,526 INFO impl.MetricsSystemImpl: JobTracker metrics system started
2023-10-25 22:54:51,537 WARN impl.MetricsSystemImpl: JobTracker metrics system already initialized!
2023-10-25 22:54:51,785 INFO mapred.FileInputFormat: Total input files to process : 1
2023-10-25 22:54:51,912 INFO mapreduce.JobSubmitter: number of splits:1
2023-10-25 22:54:52,141 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_local1007878220_0001
2023-10-25 22:54:52,141 INFO mapreduce.JobSubmitter: Executing with tokens: []
2023-10-25 22:54:52,320 INFO mapreduce.Job: The url to track the job: http://localhost:8080/
2023-10-25 22:54:52,322 INFO mapreduce.Job: Running job: job_local1007878220_0001
2023-10-25 22:54:52,327 INFO mapred.LocalJobRunner: OutputCommitter set in config null
2023-10-25 22:54:52,328 INFO mapred.LocalJobRunner: OutputCommitter is org.apache.hadoop.mapred.FileOutputCo
mmitter
2023-10-25 22:54:52,332 INFO output.FileOutputCommitter: File Output Committer Algorithm version is 2
2023-10-25 22:54:52,333 INFO output.FileOutputCommitter: FileOutputCommitter skip cleanup _temporary folders
 under output directory:false, ignore cleanup failures: false
2023-10-25 22:54:52,409 INFO mapred.LocalJobRunner: Waiting for map tasks
2023-10-25 22:54:52,412 INFO mapred.LocalJobRunner: Starting task: attempt_local1007878220_0001_m_000000_0
2023-10-25 22:54:52,455 INFO output.FileOutputCommitter: File Output Committer Algorithm version is 2
2023-10-25 22:54:52,455 INFO output.FileOutputCommitter: FileOutputCommitter skip cleanup _temporary folders
 under output directory:false, ignore cleanup failures: false
2023-10-25 22:54:52,493 INFO mapred.Task:  Using ResourceCalculatorProcessTree : [ ]
2023-10-25 22:54:52,517 INFO mapred.MapTask: Processing split: hdfs://localhost:9000/word_count_in_python/wo
rd_count.txt:0+150
2023-10-25 22:54:52,570 INFO mapred.MapTask: numReduceTasks: 1
```

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
```

```
hadoop@sanjay-VirtualBox:~/wordcount$ hdfs dfs -cat /word_count_in_python/output/part-00000
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
```

Result:

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