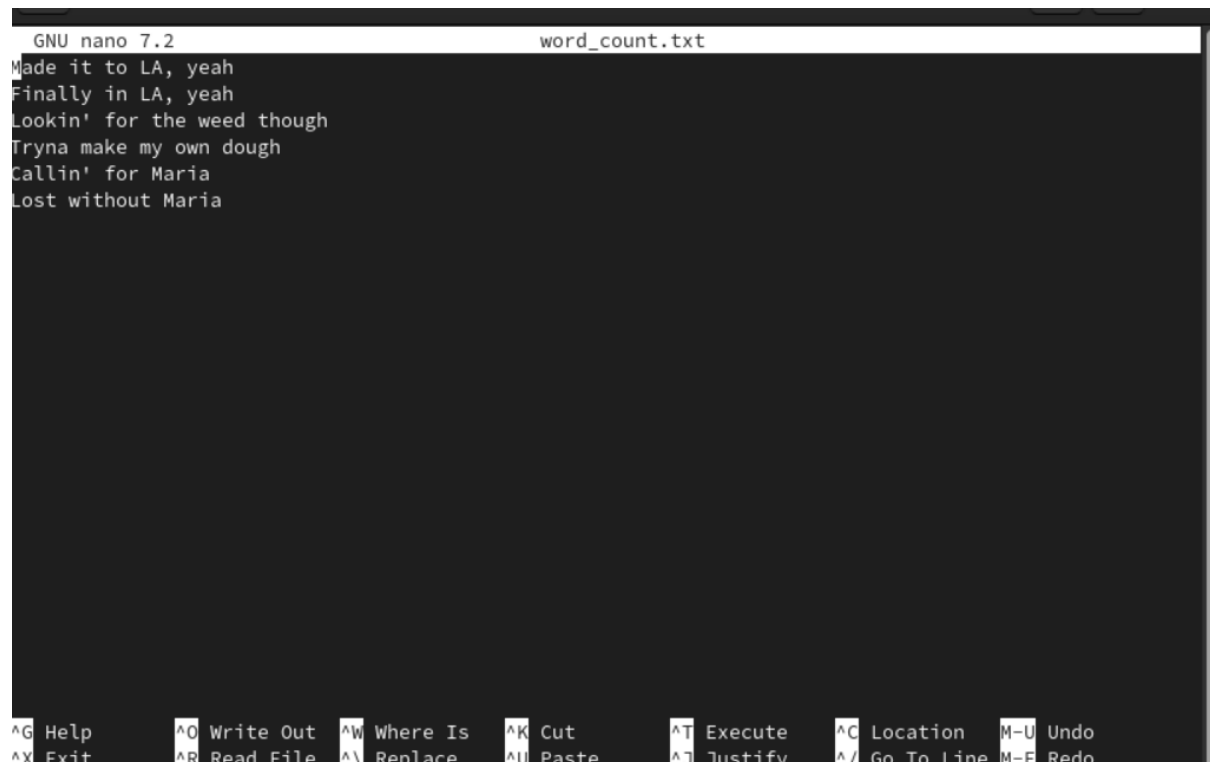


Exp No: 2**Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm****Aim:**

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

^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit      ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^_ Go To Line  M-E Redo
```

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.

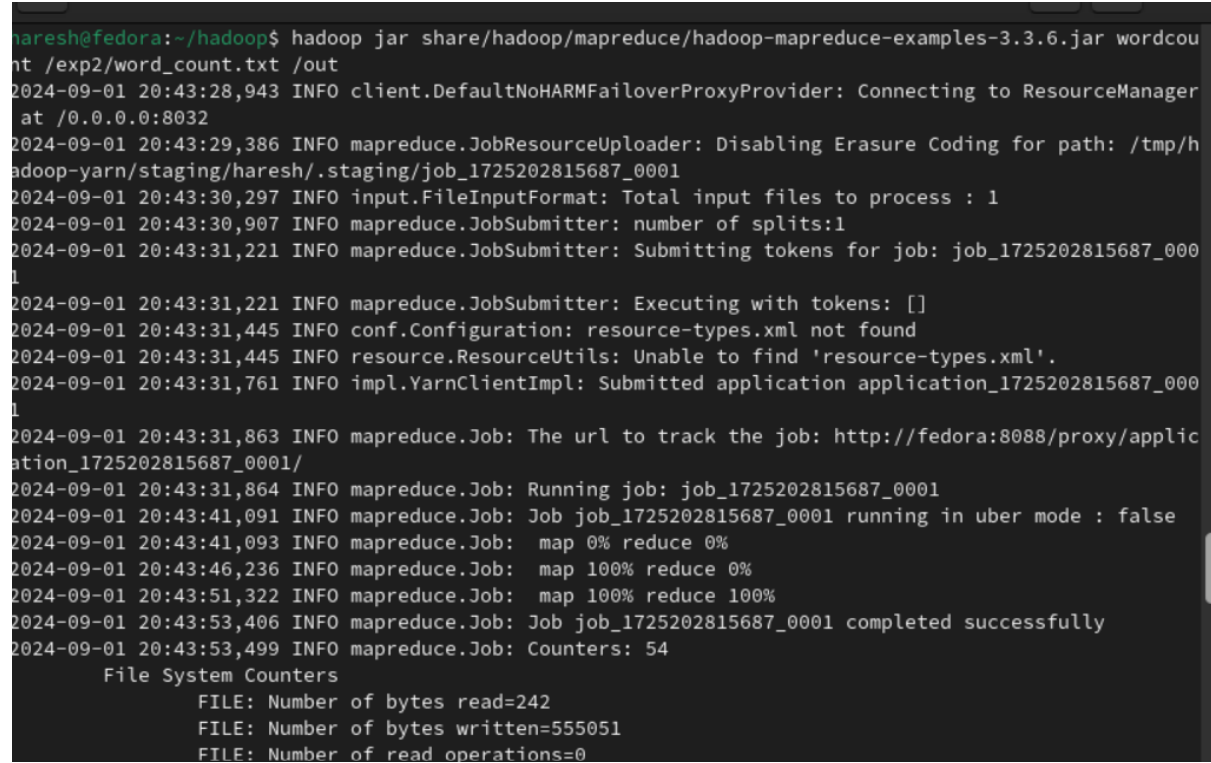
```
chmod 777 mapper.py reducer.py
```

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
```



```
haresh@fedora:~/hadoop$ hadoop jar share/hadoop/mapreduce/hadoop-mapreduce-examples-3.3.6.jar wordcount /exp2/word_count.txt /out
2024-09-01 20:43:28,943 INFO client.DefaultNoHARMFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2024-09-01 20:43:29,386 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/staging/haresh/.staging/job_1725202815687_0001
2024-09-01 20:43:30,297 INFO input.FileInputFormat: Total input files to process : 1
2024-09-01 20:43:30,907 INFO mapreduce.JobSubmitter: number of splits:1
2024-09-01 20:43:31,221 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1725202815687_0001
2024-09-01 20:43:31,221 INFO mapreduce.JobSubmitter: Executing with tokens: []
2024-09-01 20:43:31,445 INFO conf.Configuration: resource-types.xml not found
2024-09-01 20:43:31,445 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2024-09-01 20:43:31,761 INFO impl.YarnClientImpl: Submitted application application_1725202815687_0001
2024-09-01 20:43:31,863 INFO mapreduce.Job: The url to track the job: http://fedora:8088/proxy/application_1725202815687_0001/
2024-09-01 20:43:31,864 INFO mapreduce.Job: Running job: job_1725202815687_0001
2024-09-01 20:43:41,091 INFO mapreduce.Job: Job job_1725202815687_0001 running in uber mode : false
2024-09-01 20:43:41,093 INFO mapreduce.Job: map 0% reduce 0%
2024-09-01 20:43:46,236 INFO mapreduce.Job: map 100% reduce 0%
2024-09-01 20:43:51,322 INFO mapreduce.Job: map 100% reduce 100%
2024-09-01 20:43:53,406 INFO mapreduce.Job: Job job_1725202815687_0001 completed successfully
2024-09-01 20:43:53,499 INFO mapreduce.Job: Counters: 54
    File System Counters
        FILE: Number of bytes read=242
        FILE: Number of bytes written=555051
        FILE: Number of read operations=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.