ASSIGNMENT 3

PART 2 - MongoDB indexing

Most of the time, you'll want to declare your indexes before putting your application into production. This allows indexes to be built incrementally, as the data is inserted. But there are two cases where you might choose to build an index after the fact. The first case occurs when you need to import a lot of data before switching into production. For instance, you might be migrating an application to MongoDB and need to seed the database with user information from a data warehouse. You could create the indexes on your user data in advance but doing so after you have imported the data will ensure an ideally balanced and compacted index from the start. This will also minimize the net time to build the index. Use the NYSE dataset to declare your indexes before putting your application into production.

ANS-

Created new DB- Assignment_4

Then created a collections nyse_new

Created index on key: stock_volume in ascending order

```
> use assignment_4
switched to db assignment_4
>
>
> db.nyse_new.find()
>
> db.nyse_new.createIndex({"stock_volume":1})
{
        "createdCollectionAutomatically" : false,
        "numIndexesBefore" : 1,
        "numIndexesAfter" : 2,
        "ok" : 1
}
>
>
```

Then imported the nyse data to this collection using bat file

```
@echo off

FOR %%G IN (A B C D E F G H I J K L M N O P Q R S T U V W X Y Z) DO mongoimport --db assignment_4 --type csv
--collection nyse_new --headerline --file C:\temp\unzip\NYSE\NYSE_daily_prices_%%G.csv

pause
```

The indexes are correctly created.

```
>
> db.nyse_new.getIndexes()
[
        {
                "v" : 2,
                "key" : {
                        "_id" : 1
                },
                "name" : "_id_",
                "ns" : "assignment_4.nyse_new"
        },
        {
                "v" : 2,
                "key" : {
                        "stock_volume" : 1
                },
                "name" : "stock_volume_1",
                "ns" : "assignment_4.nyse_new"
        }
]
>
```

PART 3 - MongoDB Indexing

Insert the NYSE dataset into a new database. You may use the existing NYSE database created before.

Now, create indexes on existing data sets.

Ans—

Imported all the nyse data to new collection stocks

Then after that created index on key: stock_symbol in ascending order

```
>
> db.stocks.createIndex({"stock_symbol":1})
{
        "createdCollectionAutomatically" : false,
        "numIndexesBefore" : 1,
        "numIndexesAfter" : 2,
        "ok" : 1
}
>
> db.stocks.getIndexes()
[
        {
                "v" : 2,
                "key" : {
                        "_id" : 1
                },
                "name" : "_id_",
                "ns" : "assignment_4.stocks"
        },
        {
                "v" : 2,
                "key" : {
                        "stock_symbol" : 1
                },
                "name" : "stock_symbol_1",
                "ns" : "assignment_4.stocks"
        }
]
>
```

PART 4 – Programming Assignment

All hadoop commands are invoked by the bin/hadoop script. Running the hadoop script without any arguments prints the description for all commands.

Usage: hadoop [--config confdir] [--loglevel loglevel] [COMMAND] [GENERIC_OPTIONS] [COMMAND_OPTIONS]

Execute each hadoop command once and place the screenshots into a word file. If a command cannot be executed for any reason (such as, a distributed environment is needed), you may write the definition of the command, and skip execution.

http://hadoop.apache.org/docs/current/hadoop-project-dist/hadoop-common/FileSystemShell.html

Ans:

- appendToFile
- cat

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -appendToFile ~/Downloads/ebook/fileaa /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -cat /myEbooks/kvf.txt
A	1
B	2
c	3
d	7
A	1
B	2
c	3
d	7
A	1
B	2
c	3
d	7
The Project Gutenberg EBook of Studies of Trees, by Jacob Joshua Levison

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Title: Studies of Trees

Author: Jacob Joshua Levison

Release Date: June 23, 2005 [EBook #16116]

Language: English
```

- checksum

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -checksum /myEbooks/kvf.txt
/myEbooks/kvf.txt	MD5-of-0MD5-of-512CRC32C	000002000000000000000000068e3660cac1d9110c04d77ffcf11c119
```

- chgrp

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -chgrp -R user /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 2 items
-rw-r--r--   1 ankit user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- chmod

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks/kvf.txt
-rw-r--r--   1 ankit user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -chmod 777 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks/kvf.txt
-rwxrwxrwx   1 ankit user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- chown

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks/kvf.txt
-rwxrwxrwx   1 ankit user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -chown NewUser /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks/kvf.txt
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- copyFromLocal

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 2 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -copyFromLocal ~/Downloads/ebook/fileaa /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 3 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- copyToLocal

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -copyToLocal /myEbooks/kvf.txt ~/Downloads/test.txt
```

```
ankit@ankit-VirtualBox:~/Downloads$ ls -lr
total 29136
-rw-r--r-- 1 ankit ankit    10051 Jun 12 15:02 test.txt
-rw-rw-r-- 1 ankit ankit     5407 Jun 11 17:33 Q7.jar
-rw-rw-r-- 1 ankit ankit    24713 Jun 11 22:33 Q73.jar
-rw-rw-r-- 1 ankit ankit    24517 Jun 11 22:52 Q731.jar
-rw-rw-r-- 1 ankit ankit    17117 Jun 11 21:28 Q72.jar
-rw-rw-r-- 1 ankit ankit    10190 Jun 11 19:03 Q71.jar
-rw-rw-r-- 1 ankit ankit     5233 Jun 11 17:01 Q62.jar
-rw-rw-r-- 1 ankit ankit     4637 Jun 11 15:52 Q41.jar
-rw-rw-r-- 1 ankit ankit    38050 Jun  7 15:26 petrified.txt
-rw-rw-r-- 1 ankit ankit    77367 Jun 11 15:58 part-r-00000
drwxr-xr-x 2 ankit ankit     4096 Jun 11 16:22 output
drwxrwxr-x 2 ankit ankit     4096 Jun 11 17:01 NYSE
-rw-rw-r-- 1 ankit ankit     5837 Jun  7 17:46 mrwordcount.jar
-rw-rw-r-- 1 ankit ankit     5263 Jun  8 09:18 mrwordcount-2.jar
-rw-rw-r-- 1 ankit ankit 14777349 Jun 11 15:09 logs
drwxrwxr-x 8 ankit ankit     4096 Jun  8 09:54 idea-IC-191.7479.19
-rw-rw-r-- 1 ankit ankit 14777349 Jun 11 15:03 http_access.log
drwxr-xr-x 7 ankit ankit     4096 Jun 11 14:58 Engg-Of-Big-Data
drwxr-xr-x 2 ankit ankit     4096 Jun 11 22:46 ebook
ankit@ankit-VirtualBox:~/Downloads$ cat test.txt | head
A       1
B       2
c       3
d       7
A       1
B       2
c       3
d       7
A       1
B       2
ankit@ankit-VirtualBox:~/Downloads$
```

- count

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -count -q /myEbooks
       none             inf            none             inf            1               3             308377 /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -count -q /myEbooks/kvf.txt
       none             inf            none             inf            0               1              10051 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -count -u /myEbooks/kvf.txt
       none             inf            none             inf /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -count -h /myEbooks/kvf.txt
           0            1             9.8 K /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -count -h /myEbooks
           1            3           301.1 K /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- cp

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /testdir
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -cp /myEbooks/kvf.txt /testdir
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /testdir
Found 1 items
-rw-r--r--   1 ankit supergroup      10051 2019-06-12 15:08 /testdir/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- createSnapshot

Create a snapshot of a snapshottable directory. This operation requires owner privilege of the snapshottable directory.

Command:

hdfs dfs -createSnapshot <path> [<snapshotName>]

- deleteSnapshot

Delete a snapshot of from a snapshottable directory. This operation requires owner privilege of the snapshottable directory.

Command:

hdfs dfs -deleteSnapshot <path> <snapshotName>

- df

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -df /
Filesystem                    Size        Used    Available  Use%
hdfs://localhost:9000  52414619648  1051281306  33708437504    2%
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -df -h /
Filesystem                Size      Used  Available  Use%
hdfs://localhost:9000  48.8 G  1002.6 M     31.4 G    2%
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- du

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -du -h /
0          /31May
169.0 K    /Assignment3_Q7Output
75.6 K     /IpCountMR
281.6 K    /ebooks
37.2 K     /gutenberg
20.2 K     /gutenbergOutput1
20.2 K     /gutenbergOutput2
14.1 M     /logs
75.6 K     /logsOutput
301.1 K    /myEbooks
487.4 M    /nyse
27.3 K     /nyseOutput
487.4 M    /nyse_merged
9.8 K      /testdir
4.1 M      /tmp
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- dus

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -dus /
dus: DEPRECATED: Please use 'du -s' instead.
1042254641  /
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -dus -h /
dus: DEPRECATED: Please use 'du -s' instead.
994.0 M  /
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- expunge

Usage: hadoop fs -expunge

Permanently delete files in checkpoints older than the retention threshold from trash directory and create new checkpoint.

When checkpoint is created, recently deleted files in trash are moved under the checkpoint. Files in checkpoints older than fs.trash.interval will be permanently deleted on the next invocation of -expunge command.

- find

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -find /myEbooks -name kvf.txt
/myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -find / -name kvf.txt
/myEbooks/kvf.txt
/testdir/kvf.txt
```

- get

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -get /myEbooks/kvf.txt ~/Downloads/copy/test
```

```
ankit@ankit-VirtualBox:~/Downloads/copy$ ls -lr
total 12
-rw-r--r-- 1 ankit ankit 10051 Jun 12 15:22 test
ankit@ankit-VirtualBox:~/Downloads/copy$
```

- getfacl

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$  hadoop fs -getfacl /myEbooks/kvf.txt
# file: /myEbooks/kvf.txt
# owner: NewUser
# group: user
user::rwx
group::rwx
other::rwx

ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -getfacl /
# file: /
# owner: ankit
# group: supergroup
user::rwx
group::r-x
other::r-x
```

- getfattr

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -getfattr -d /
# file: /
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -getfattr -d /myEbooks/kvf.txt
# file: /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- getmerge

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -getmerge /ebooks ~/Downloads/copy/output.txt
```

```
ankit@ankit-VirtualBox:~/Downloads/copy$ ls -lr -h
total 296K
-rw-r--r-- 1 ankit ankit 9.9K Jun 12 15:22 test
-rw-r--r-- 1 ankit ankit 282K Jun 12 15:28 output.txt
ankit@ankit-VirtualBox:~/Downloads/copy$
```

- help

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -help
Usage: hadoop fs [generic options]
        [-appendToFile <localsrc> ... <dst>]
        [-cat [-ignoreCrc] <src> ...]
        [-checksum <src> ...]
        [-chgrp [-R] GROUP PATH...]
        [-chmod [-R] <MODE[,MODE]... | OCTALMODE> PATH...]
        [-chown [-R] [OWNER][:[GROUP]] PATH...]
        [-copyFromLocal [-f] [-p] [-l] [-d] <localsrc> ... <dst>]
        [-copyToLocal [-f] [-p] [-ignoreCrc] [-crc] <src> ... <localdst>]
        [-count [-q] [-h] [-v] [-t [<storage type>]] [-u] [-x] <path> ...]
        [-cp [-f] [-p | -p[topax]] [-d] <src> ... <dst>]
        [-createSnapshot <snapshotDir> [<snapshotName>]]
        [-deleteSnapshot <snapshotDir> <snapshotName>]
        [-df [-h] [<path> ...]]
        [-du [-s] [-h] [-x] <path> ...]
        [-expunge]
        [-find <path> ... <expression> ...]
        [-get [-f] [-p] [-ignoreCrc] [-crc] <src> ... <localdst>]
        [-getfacl [-R] <path>]
        [-getfattr [-R] {-n name | -d} [-e en] <path>]
        [-getmerge [-nl] [-skip-empty-file] <src> <localdst>]
        [-help [cmd ...]]
        [-ls [-C] [-d] [-h] [-q] [-R] [-t] [-S] [-r] [-u] [<path> ...]]
        [-mkdir [-p] <path> ...]
        [-moveFromLocal <localsrc> ... <dst>]
```

- ls

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /
Found 15 items
drwxr-xr-x   - ankit supergroup          0 2019-06-06 05:34 /31May
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:53 /Assignment3_Q7Output
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:00 /IpCountMR
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:48 /ebooks
drwxr-xr-x   - ankit supergroup          0 2019-06-07 15:32 /gutenberg
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:10 /gutenbergOutput1
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:29 /gutenbergOutput2
-rw-r--r--   1 ankit supergroup   14777349 2019-06-11 15:59 /logs
drwxr-xr-x   - ankit supergroup          0 2019-06-11 15:55 /logsOutput
drwxr-xr-x   - ankit user                0 2019-06-12 14:59 /myEbooks
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:14 /nyse
drwxr-xr-x   - ankit supergroup          0 2019-06-11 17:03 /nyseOutput
-rw-r--r--   1 ankit supergroup  511085653 2019-06-11 16:23 /nyse_merged
drwxr-xr-x   - ankit supergroup          0 2019-06-12 15:08 /testdir
drwx------   - ankit supergroup          0 2019-06-07 17:48 /tmp
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- lsr

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -lsr /
lsr: DEPRECATED: Please use 'ls -R' instead.
drwxr-xr-x   - ankit supergroup          0 2019-06-06 05:34 /31May
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:53 /Assignment3_Q7Output
drwxr-xr-x   - ankit supergroup          0 2019-06-11 17:38 /Assignment3_Q7Output/A_TextInputFormat
-rw-r--r--   1 ankit supergroup          0 2019-06-11 17:38 /Assignment3_Q7Output/A_TextInputFormat/_SUCCESS
-rw-r--r--   1 ankit supergroup      86505 2019-06-11 17:38 /Assignment3_Q7Output/A_TextInputFormat/part-r-00000
drwxr-xr-x   - ankit supergroup          0 2019-06-11 19:05 /Assignment3_Q7Output/B_KeyValueTextInputFormat
-rw-r--r--   1 ankit supergroup          0 2019-06-11 19:05 /Assignment3_Q7Output/B_KeyValueTextInputFormat/_SUCCESS
-rw-r--r--   1 ankit supergroup         16 2019-06-11 19:05 /Assignment3_Q7Output/B_KeyValueTextInputFormat/part-r-00000
drwxr-xr-x   - ankit supergroup          0 2019-06-11 21:37 /Assignment3_Q7Output/C_NLineInputFormat
-rw-r--r--   1 ankit supergroup          0 2019-06-11 21:37 /Assignment3_Q7Output/C_NLineInputFormat/_SUCCESS
-rw-r--r--   1 ankit supergroup      86505 2019-06-11 21:37 /Assignment3_Q7Output/C_NLineInputFormat/part-r-00000
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:54 /Assignment3_Q7Output/D_CombineInputFileFormat1
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:00 /IpCountMR
-rw-r--r--   1 ankit supergroup          0 2019-06-11 16:00 /IpCountMR/_SUCCESS
```

- mkdir

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /test
ls: `/test': No such file or directory
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -mkdir /test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /
Found 16 items
drwxr-xr-x   - ankit supergroup          0 2019-06-06 05:34 /31May
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:53 /Assignment3_Q7Output
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:00 /IpCountMR
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:48 /ebooks
drwxr-xr-x   - ankit supergroup          0 2019-06-07 15:32 /gutenberg
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:10 /gutenbergOutput1
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:29 /gutenbergOutput2
-rw-r--r--   1 ankit supergroup   14777349 2019-06-11 15:59 /logs
drwxr-xr-x   - ankit supergroup          0 2019-06-11 15:55 /logsOutput
drwxr-xr-x   - ankit user                0 2019-06-12 14:59 /myEbooks
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:14 /nyse
drwxr-xr-x   - ankit supergroup          0 2019-06-11 17:03 /nyseOutput
-rw-r--r--   1 ankit supergroup  511085653 2019-06-11 16:23 /nyse_merged
drwxr-xr-x   - ankit supergroup          0 2019-06-12 15:32 /test
```

- moveFromLocal

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 3 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -moveFromLocal ~/Downloads/copy/output.txt /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 4 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user     288326 2019-06-12 15:35 /myEbooks/output.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

```
ankit@ankit-VirtualBox:~/Downloads/copy$ ls -lr -h
total 296K
-rw-r--r-- 1 ankit ankit 9.9K Jun 12 15:22 test
-rw-r--r-- 1 ankit ankit 282K Jun 12 15:28 output.txt
ankit@ankit-VirtualBox:~/Downloads/copy$ ls -lr -h
total 12K
-rw-r--r-- 1 ankit ankit 9.9K Jun 12 15:22 test
ankit@ankit-VirtualBox:~/Downloads/copy$
```

- moveToLocal

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -moveToLocal ~/Downloads/copy/output.txt /myEbooks
moveToLocal: Option '-moveToLocal' is not implemented yet.
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- mv

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 4 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user     288326 2019-06-12 15:35 /myEbooks/output.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks/output.txt /test
-rw-r--r--   1 ankit user     288326 2019-06-12 15:35 /myEbooks/output.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -mv /myEbooks/output.txt /test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /test
Found 1 items
-rw-r--r--   1 ankit user     288326 2019-06-12 15:35 /test/output.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEBooks
ls: `/myEBooks': No such file or directory
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 3 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- put

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 4 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -put ~/Downloads/copy/petrified.txt /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 5 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user      38050 2019-06-12 15:41 /myEbooks/petrified.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- renameSnapshot

Rename a snapshot. This operation requires owner privilege of the snapshottable directory.

Command:

hdfs dfs -renameSnapshot <path> <oldName> <newName>

- rm

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 5 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rw-r--r--   1 ankit   user      10000 2019-06-12 14:59 /myEbooks/fileaa
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user      38050 2019-06-12 15:41 /myEbooks/petrified.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -rm /myEbooks/fileaa
Deleted /myEbooks/fileaa
```

- rmdir

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -rmdir /test
rmdir: `/test': Directory is not empty
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -rmdir /31stMay
rmdir: `/31stMay': No such file or directory
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /
Found 16 items
drwxr-xr-x   - ankit supergroup          0 2019-06-06 05:34 /31May
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:53 /Assignment3_Q7Output
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:00 /IpCountMR
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:48 /ebooks
drwxr-xr-x   - ankit supergroup          0 2019-06-07 15:32 /gutenberg
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:10 /gutenbergOutput1
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:29 /gutenbergOutput2
-rw-r--r--   1 ankit supergroup   14777349 2019-06-11 15:59 /logs
drwxr-xr-x   - ankit supergroup          0 2019-06-11 15:55 /logsOutput
drwxr-xr-x   - ankit user                0 2019-06-12 15:42 /myEbooks
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:14 /nyse
drwxr-xr-x   - ankit supergroup          0 2019-06-11 17:03 /nyseOutput
-rw-r--r--   1 ankit supergroup  511085653 2019-06-11 16:23 /nyse_merged
drwxr-xr-x   - ankit supergroup          0 2019-06-12 15:38 /test
drwxr-xr-x   - ankit supergroup          0 2019-06-12 15:08 /testdir
drwx------   - ankit supergroup          0 2019-06-07 17:48 /tmp
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -rmdir /31May
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /
Found 15 items
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:53 /Assignment3_Q7Output
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:00 /IpCountMR
drwxr-xr-x   - ankit supergroup          0 2019-06-11 22:48 /ebooks
drwxr-xr-x   - ankit supergroup          0 2019-06-07 15:32 /gutenberg
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:10 /gutenbergOutput1
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:29 /gutenbergOutput2
-rw-r--r--   1 ankit supergroup   14777349 2019-06-11 15:59 /logs
drwxr-xr-x   - ankit supergroup          0 2019-06-11 15:55 /logsOutput
drwxr-xr-x   - ankit user                0 2019-06-12 15:42 /myEbooks
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:14 /nyse
drwxr-xr-x   - ankit supergroup          0 2019-06-11 17:03 /nyseOutput
-rw-r--r--   1 ankit supergroup  511085653 2019-06-11 16:23 /nyse_merged
drwxr-xr-x   - ankit supergroup          0 2019-06-12 15:38 /test
drwxr-xr-x   - ankit supergroup          0 2019-06-12 15:08 /testdir
drwx------   - ankit supergroup          0 2019-06-07 17:48 /tmp
```

- rmr

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -rmr /test
rmr: DEPRECATED: Please use '-rm -r' instead.
Deleted /test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- setfacl

Usage: hadoop fs -setfacl [-R] [-b |-k -m |-x <acl_spec> <path>] |[--set <acl_spec> <path>]

Sets Access Control Lists (ACLs) of files and directories.

- setfattr

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -setfattr -n user.noValue /myEbooks/petrified.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 4 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rwxrwxrwx   1 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user      38050 2019-06-12 15:41 /myEbooks/petrified.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- setrep

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -setrep -R 3 /myEbooks/kvf.txt
Replication 3 set: /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- stat

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -stat "type:%F perm:%a %u:%g size:%b mtime:%y atime:%x name:%n" /myEbooks/kvf.txt
type:regular file perm:a NewUser:user size:10051 mtime:2019-06-12 18:48:05 atime:x name:kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -stat "type:%F perm:%a %u:%g size:%b mtime:%y atime:%x name:%n" /myEbooks
type:directory perm:a ankit:user size:0 mtime:2019-06-12 19:42:35 atime:x name:myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- tail

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -tail /myEbooks/kvf.txt
ches or more in length. These needles
    keep green throughout the entire year. This is characteristic of all
    coniferous trees, except the larch and cypress, which shed their
    leaves in winter.

[Illustration: FIG. 2.--Twig of the White Pine.]

    The pines are widely distributed throughout the Northern Hemisphere,
    and include about 80 distinct species with over 600 varieties. The
    species enumerated here are especially common in the eastern part of
    the United states, growing either native in the forest or under
    cultivation in the parks. The pines form a very important class of
    timber trees, and produce beautiful effects when planted in groups
    in the parks.

How to tell them from each other: The pine needles are arranged in
    _clusters_; see Fig. 1. Each species has a certain characteristic
    number of needles to the cluster and this fact generally provides
    the simplest and most direct way of distinguishing the different
```

- test

Usage: hadoop fs -test -[defsz] URI

Options:

-d: f the path is a directory, return 0.
-e: if the path exists, return 0.
-f: if the path is a file, return 0.
-s: if the path is not empty, return 0.
-r: if the path exists and read permission is granted, return 0.
-w: if the path exists and write permission is granted, return 0.
-z: if the file is zero length, return 0.

Example:

hadoop fs -test -e filename

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -test -e /myEbooks/kvf.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -test -e /myEbooks
```

- text

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -text /myEbooks/test
A	1
B	2
c	3
d	7
A	1
B	2
c	3
d	7
A	1
B	2
c	3
d	7
The Project Gutenberg EBook of Studies of Trees, by Jacob Joshua Levison

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almost no restrictions whatsoever.  You may copy it, give it away or
re-use it under the terms of the Project Gutenberg License included
with this eBook or online at www.gutenberg.net
```

- touchz

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 4 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rwxrwxrwx   3 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   3 ankit   user      38050 2019-06-12 15:41 /myEbooks/petrified.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -touchz /myEbooks/newFile
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 5 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rwxrwxrwx   3 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user          0 2019-06-12 15:55 /myEbooks/newFile
-rw-r--r--   3 ankit   user      38050 2019-06-12 15:41 /myEbooks/petrified.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- truncate

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 5 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rwxrwxrwx   3 NewUser user      10051 2019-06-12 14:48 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user          0 2019-06-12 15:55 /myEbooks/newFile
-rw-r--r--   3 ankit   user      38050 2019-06-12 15:41 /myEbooks/petrified.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -truncate 127 /myEbooks/kvf.txt
Truncating /myEbooks/kvf.txt to length: 127. Wait for block recovery to complete before further updating this file.
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 5 items
-rw-r--r--   1 ankit   user     288326 2019-06-11 17:35 /myEbooks/ebook.txt
-rwxrwxrwx   3 NewUser user        127 2019-06-12 15:56 /myEbooks/kvf.txt
-rw-r--r--   1 ankit   user          0 2019-06-12 15:55 /myEbooks/newFile
-rw-r--r--   3 ankit   user      38050 2019-06-12 15:41 /myEbooks/petrified.txt
-rw-r--r--   1 ankit   user      10051 2019-06-12 15:40 /myEbooks/test
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

- usage

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -usage ls
Usage: hadoop fs [generic options] -ls [-C] [-d] [-h] [-q] [-R] [-t] [-S] [-r] [-u] [<path> ...]
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -usage mv
Usage: hadoop fs [generic options] -mv <src> ... <dst>
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -usage truncate
Usage: hadoop fs [generic options] -truncate [-w] <length> <path> ...
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

PART 5 – Programming Assignment

Copy the attached 'http_access.log' file into HDFS under /logs directory.

Using the access.log file stored in HDFS, implement MapReduce in Hadoop to find the number of times each IP accessed the website.

Ans--

copy http_access.log to /logs

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -copyFromLocal /home/ankit/Downloads/http_access.log /logs
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop jar /home/ankit/Downloads/Q41.jar MR.LogMainMR /logs/ /IpCountMR
19/06/11 16:00:12 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0:8032
19/06/11 16:00:13 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
19/06/11 16:00:13 INFO input.FileInputFormat: Total input files to process : 1
19/06/11 16:00:13 INFO mapreduce.JobSubmitter: number of splits:1
19/06/11 16:00:14 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1560279693514_0003
19/06/11 16:00:14 INFO impl.YarnClientImpl: Submitted application application_1560279693514_0003
19/06/11 16:00:14 INFO mapreduce.Job: The url to track the job: http://ankit-VirtualBox:8088/proxy/application_1560279693514_0003/
19/06/11 16:00:14 INFO mapreduce.Job: Running job: job_1560279693514_0003
19/06/11 16:00:24 INFO mapreduce.Job: Job job_1560279693514_0003 running in uber mode : false
19/06/11 16:00:24 INFO mapreduce.Job:  map 0% reduce 0%
```

Also ran MAP reduce on the logs to count the number of times ip is used

The program folder is inside the Assignment folder

Output head is as follows

```
19/06/11 16:00:24 INFO mapreduce.Job: Job job_1560279693514_0003 running in uber mode : false
19/06/11 16:00:24 INFO mapreduce.Job:  map 0% reduce 0%
19/06/11 16:00:44 INFO mapreduce.Job:  map 100% reduce 0%
19/06/11 16:00:53 INFO mapreduce.Job:  map 100% reduce 100%
19/06/11 16:00:54 INFO mapreduce.Job: Job job_1560279693514_0003 completed successfully
19/06/11 16:00:55 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=2996770
                FILE: Number of bytes written=6309919
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=14777440
                HDFS: Number of bytes written=77367
                HDFS: Number of read operations=6
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=2
        Job Counters
                Launched map tasks=1
                Launched reduce tasks=1
                Data-local map tasks=1
                Total time spent by all maps in occupied slots (ms)=17259
                Total time spent by all reduces in occupied slots (ms)=6057
                Total time spent by all map tasks (ms)=17259
                Total time spent by all reduce tasks (ms)=6057
                Total vcore-milliseconds taken by all map tasks=17259
                Total vcore-milliseconds taken by all reduce tasks=6057
                Total megabyte-milliseconds taken by all map tasks=17673216
                Total megabyte-milliseconds taken by all reduce tasks=6202368
        Map-Reduce Framework
                Map input records=148202
                Map output records=148202
                Map output bytes=2700360
                Map output materialized bytes=2996770
                Input split bytes=91
                Combine input records=0
                Combine output records=0
                Reduce input groups=4713
                Reduce shuffle bytes=2996770
                Reduce input records=148202
                Reduce output records=4713
                Spilled Records=296404
                Shuffled Maps =1
                Failed Shuffles=0
                Merged Map outputs=1
                GC time elapsed (ms)=487
                CPU time spent (ms)=5030
```

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -cat /IpCountMR/part-r-00000 | head
        1
1.170.44.84     164
1.179.132.221   103
1.186.119.102   4
1.202.184.142   2
1.202.184.145   2
1.202.22.83     1
1.202.89.134    3
1.22.56.96      10
1.23.162.141    1
```

PART 6 – Programming Assignment

Download and Copy all the files (http://msis.neu.edu/nyse/) (DailyPrices_A to DailyPrices_Z) to a folder in HDFS.

Write a MapReduce to find the Max price of stock_price_high for each stock. Capture the running time programmatically (or manually using a wristwatch or smartphone).

Ans--

Download and Copy all the files (http://msis.neu.edu/nyse/) (DailyPrices_A to DailyPrices_Z) to a folder in HDFS.

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -put ~/Downloads/NYSE /nyse
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /nyse
Found 26 items
-rw-r--r--   1 ankit supergroup   40990992 2019-06-11 16:13 /nyse/NYSE_daily_prices_A.csv
-rw-r--r--   1 ankit supergroup   32034760 2019-06-11 16:13 /nyse/NYSE_daily_prices_B.csv
-rw-r--r--   1 ankit supergroup   45790256 2019-06-11 16:13 /nyse/NYSE_daily_prices_C.csv
-rw-r--r--   1 ankit supergroup   19234471 2019-06-11 16:13 /nyse/NYSE_daily_prices_D.csv
-rw-r--r--   1 ankit supergroup   22104043 2019-06-11 16:13 /nyse/NYSE_daily_prices_E.csv
-rw-r--r--   1 ankit supergroup   17387253 2019-06-11 16:13 /nyse/NYSE_daily_prices_F.csv
-rw-r--r--   1 ankit supergroup   22608522 2019-06-11 16:13 /nyse/NYSE_daily_prices_G.csv
-rw-r--r--   1 ankit supergroup   23127143 2019-06-11 16:13 /nyse/NYSE_daily_prices_H.csv
-rw-r--r--   1 ankit supergroup   20680033 2019-06-11 16:13 /nyse/NYSE_daily_prices_I.csv
-rw-r--r--   1 ankit supergroup    9537527 2019-06-11 16:14 /nyse/NYSE_daily_prices_J.csv
-rw-r--r--   1 ankit supergroup   14782892 2019-06-11 16:14 /nyse/NYSE_daily_prices_K.csv
-rw-r--r--   1 ankit supergroup   12958785 2019-06-11 16:14 /nyse/NYSE_daily_prices_L.csv
-rw-r--r--   1 ankit supergroup   38124545 2019-06-11 16:14 /nyse/NYSE_daily_prices_M.csv
-rw-r--r--   1 ankit supergroup   31488945 2019-06-11 16:14 /nyse/NYSE_daily_prices_N.csv
-rw-r--r--   1 ankit supergroup    8865718 2019-06-11 16:14 /nyse/NYSE_daily_prices_O.csv
-rw-r--r--   1 ankit supergroup   31943478 2019-06-11 16:14 /nyse/NYSE_daily_prices_P.csv
-rw-r--r--   1 ankit supergroup     190989 2019-06-11 16:14 /nyse/NYSE_daily_prices_Q.csv
-rw-r--r--   1 ankit supergroup   16808595 2019-06-11 16:14 /nyse/NYSE_daily_prices_R.csv
-rw-r--r--   1 ankit supergroup   31852353 2019-06-11 16:14 /nyse/NYSE_daily_prices_S.csv
-rw-r--r--   1 ankit supergroup   28754690 2019-06-11 16:14 /nyse/NYSE_daily_prices_T.csv
-rw-r--r--   1 ankit supergroup    9951590 2019-06-11 16:14 /nyse/NYSE_daily_prices_U.csv
-rw-r--r--   1 ankit supergroup    9503196 2019-06-11 16:14 /nyse/NYSE_daily_prices_V.csv
-rw-r--r--   1 ankit supergroup   15972013 2019-06-11 16:14 /nyse/NYSE_daily_prices_W.csv
-rw-r--r--   1 ankit supergroup    3613198 2019-06-11 16:14 /nyse/NYSE_daily_prices_X.csv
-rw-r--r--   1 ankit supergroup     686216 2019-06-11 16:14 /nyse/NYSE_daily_prices_Y.csv
-rw-r--r--   1 ankit supergroup    2093424 2019-06-11 16:14 /nyse/NYSE_daily_prices_Z.csv
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

Merging all records in single file and saving in HDFS

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -getmerge -nl /nyse ~/Downloads/output/all_stocks.csv
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -copyFromLocal /home/ankit/Downloads/output/all_stocks.csv /nyse_merged
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /
Found 12 items
drwxr-xr-x   - ankit supergroup          0 2019-06-06 05:34 /31May
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:00 /IpCountMR
drwxr-xr-x   - ankit supergroup          0 2019-06-07 15:32 /gutenberg
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:10 /gutenbergOutput1
drwxr-xr-x   - ankit supergroup          0 2019-06-08 09:29 /gutenbergOutput2
-rw-r--r--   1 ankit supergroup   14777349 2019-06-11 15:59 /logs
drwxr-xr-x   - ankit supergroup          0 2019-06-11 15:55 /logsOutput
drwxr-xr-x   - ankit supergroup          0 2019-06-06 07:00 /myEbooks
drwxr-xr-x   - ankit supergroup          0 2019-06-11 16:14 /nyse
-rw-r--r--   1 ankit supergroup  511085653 2019-06-11 16:23 /nyse_merged
drwxr-xr-x   - ankit supergroup          0 2019-06-05 11:25 /testdir
drwx------   - ankit supergroup          0 2019-06-07 17:48 /tmp
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /nyse_merged
```

The java program is in the assignment folder

Output of MapReduce for maximum stock_price_high for each stock is as follows:

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop jar /home/ankit/Downloads/Q61.jar com.hadoop.assignment3_q6.NyseMainMR /nyse_merged/ /nyseOutput
19/06/11 17:02:31 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0:8032
19/06/11 17:02:32 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
19/06/11 17:02:32 INFO input.FileInputFormat: Total input files to process : 1
19/06/11 17:02:33 INFO mapreduce.JobSubmitter: number of splits:4
19/06/11 17:02:33 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1560279693514_0006
19/06/11 17:02:34 INFO impl.YarnClientImpl: Submitted application application_1560279693514_0006
19/06/11 17:02:34 INFO mapreduce.Job: The url to track the job: http://ankit-VirtualBox:8088/proxy/application_1560279693514_0006/
19/06/11 17:02:34 INFO mapreduce.Job: Running job: job_1560279693514_0006
19/06/11 17:02:43 INFO mapreduce.Job: Job job_1560279693514_0006 running in uber mode : false
19/06/11 17:02:43 INFO mapreduce.Job:  map 0% reduce 0%
19/06/11 17:03:27 INFO mapreduce.Job:  map 60% reduce 0%
19/06/11 17:03:33 INFO mapreduce.Job:  map 67% reduce 0%
19/06/11 17:03:34 INFO mapreduce.Job:  map 75% reduce 0%
19/06/11 17:03:35 INFO mapreduce.Job:  map 92% reduce 0%
19/06/11 17:03:36 INFO mapreduce.Job:  map 100% reduce 0%
19/06/11 17:03:48 INFO mapreduce.Job:  map 100% reduce 100%
19/06/11 17:03:49 INFO mapreduce.Job: Job job_1560279693514_0006 completed successfully
19/06/11 17:03:49 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=128173371
                FILE: Number of bytes written=257138082
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=511098333
                HDFS: Number of bytes written=27922
                HDFS: Number of read operations=15
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=2
```

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /nyseOutput
Found 2 items
-rw-r--r--   1 ankit supergroup          0 2019-06-11 17:03 /nyseOutput/_SUCCESS
-rw-r--r--   1 ankit supergroup      27922 2019-06-11 17:03 /nyseOutput/part-r-00000
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -cat /nyseOutput/part-r-00000
AA      94.62
AAI     57.88
AAN     35.21
AAP     83.65
AAR     25.25
AAV     24.78
AB      94.94
ABA     27.94
ABB     33.39
ABC     84.35
ABD     28.58
ABG     30.06
ABK     96.1
ABM     41.63
ABR     34.45
ABT     93.37
ABV     107.5
ABVT    100.0
ABX     54.74
ACC     37.0
ACE     104.0
ACF     64.9
ACG     12.63
ACH     111.6
ACI     112.89
ACL     178.56
ACM     38.25
ACN     44.03
ACO     42.7
ACS     109.55
ACV     65.32
ADC     37.7
ADI     185.5
ADM     48.95
ADP     84.31
ADS     80.79
ADX     40.56
ADY     44.0
AEA     23.94
```

PART 7 – Programming Assignment

Write one MapReduce program using each of the classes that extend FileInputFormat<k,v>

(CombineFileInputFormat, FixedLengthInputFormat, KeyValueTextInputFormat, NLineInputFormat, SequenceFileInputFormat, TextInputFormat)

http://hadoop.apache.org/docs/current/api/org/apache/hadoop/mapreduce/lib/input/FileInputFormat.html

You could use any input file of your choice. The size of the input files is not important. The MR programs could simply do counting, or any other analysis you choose.

Ans--

1> TextInputFormat

Code in package textInputFormat

Output

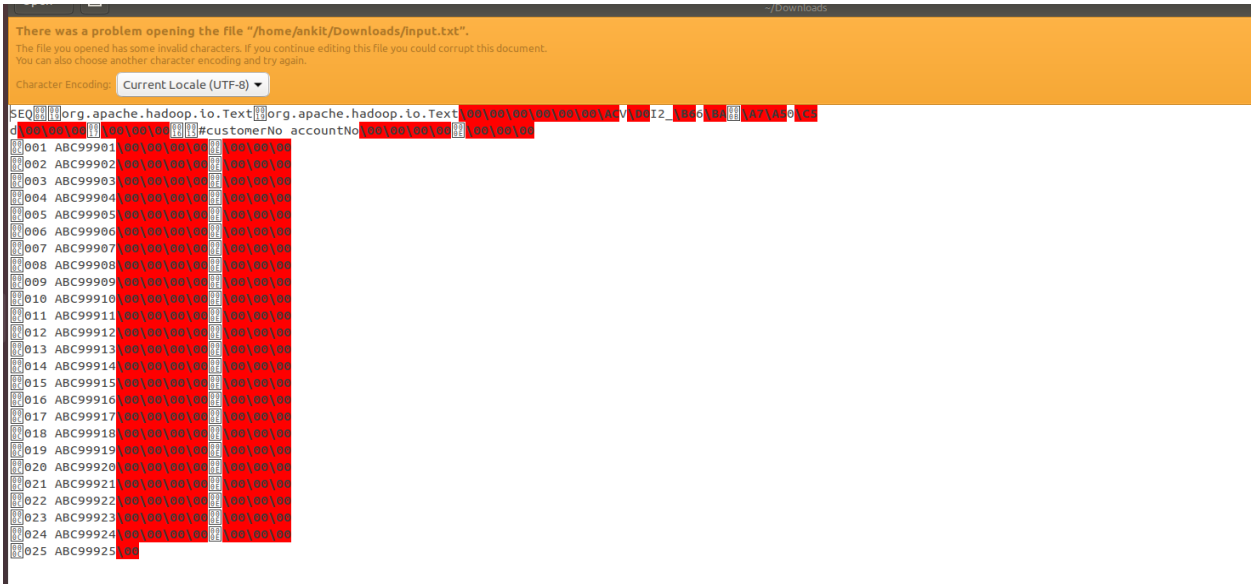
```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -copyFromLocal ~/Downloads/ebook.txt /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 1 items
-rw-r--r--   1 ankit supergroup     288326 2019-06-11 17:35 /myEbooks/ebook.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop jar /home/ankit/Downloads/Q7.jar com.hadoop.assignment3_q7.textInputFormat.TextMainMR /myEbooks/ebook.txt /Assignment3_Q7Output/A_TextInputFo
rmat
19/06/11 17:37:21 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0:8032
19/06/11 17:37:22 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
19/06/11 17:37:23 INFO input.FileInputFormat: Total input files to process : 1
19/06/11 17:37:23 INFO mapreduce.JobSubmitter: number of splits:1
19/06/11 17:37:23 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1560279693514_0007
19/06/11 17:37:23 INFO impl.YarnClientImpl: Submitted application application_1560279693514_0007
19/06/11 17:37:24 INFO mapreduce.Job: The url to track the job: http://ankit-VirtualBox:8088/proxy/application_1560279693514_0007/
19/06/11 17:37:24 INFO mapreduce.Job: Running job: job_1560279693514_0007
19/06/11 17:37:35 INFO mapreduce.Job: Job job_1560279693514_0007 running in uber mode : false
19/06/11 17:37:35 INFO mapreduce.Job:  map 0% reduce 0%
19/06/11 17:38:00 INFO mapreduce.Job:  map 100% reduce 0%
19/06/11 17:38:08 INFO mapreduce.Job:  map 100% reduce 100%
19/06/11 17:38:11 INFO mapreduce.Job: Job job_1560279693514_0007 completed successfully
19/06/11 17:38:11 INFO mapreduce.Job: Counters: 49
```


```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -copyFromLocal ~/Downloads/ebook.txt /myEbooks
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -ls /myEbooks
Found 1 items
-rw-r--r--   1 ankit supergroup     288326 2019-06-11 17:35 /myEbooks/ebook.txt
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop jar /home/ankit/Downloads/Q7.jar com.hadoop.assignment3_q7.textInputFormat.TextMainMR /myEbooks/ebook.txt /Assignment3_Q7Output/A_TextInputFo
rmat
19/06/11 17:37:21 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0:8032
19/06/11 17:37:22 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
19/06/11 17:37:23 INFO input.FileInputFormat: Total input files to process : 1
19/06/11 17:37:23 INFO mapreduce.JobSubmitter: number of splits:1
19/06/11 17:37:23 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1560279693514_0007
19/06/11 17:37:23 INFO impl.YarnClientImpl: Submitted application application_1560279693514_0007
19/06/11 17:37:24 INFO mapreduce.Job: The url to track the job: http://ankit-VirtualBox:8088/proxy/application_1560279693514_0007/
19/06/11 17:37:24 INFO mapreduce.Job: Running job: job_1560279693514_0007
19/06/11 17:37:35 INFO mapreduce.Job: Job job_1560279693514_0007 running in uber mode : false
19/06/11 17:37:35 INFO mapreduce.Job:  map 0% reduce 0%
19/06/11 17:38:00 INFO mapreduce.Job:  map 100% reduce 0%
19/06/11 17:38:08 INFO mapreduce.Job:  map 100% reduce 100%
19/06/11 17:38:11 INFO mapreduce.Job: Job job_1560279693514_0007 completed successfully
19/06/11 17:38:11 INFO mapreduce.Job: Counters: 49
```

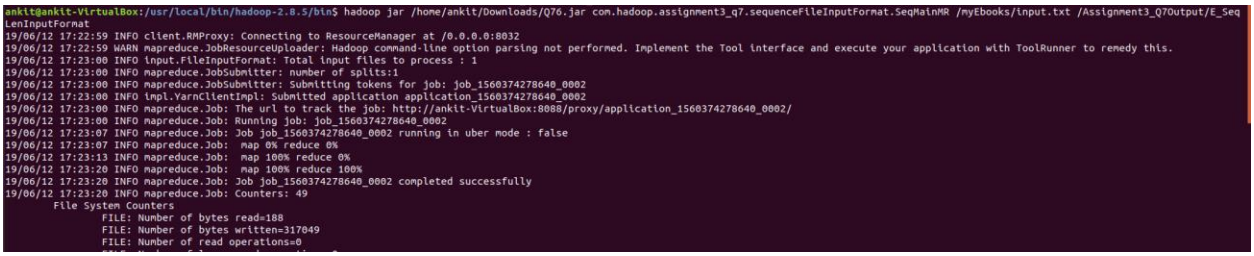
2> SequenceFileInputFormat

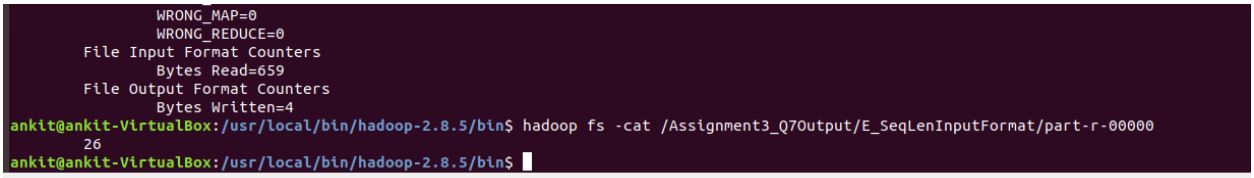
The code is in package seqFileInputFormat

Input Sequence File-



Output



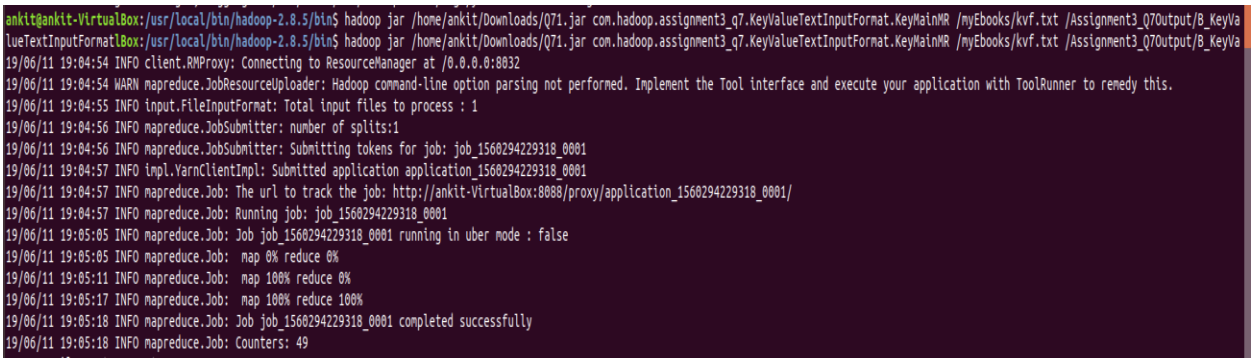


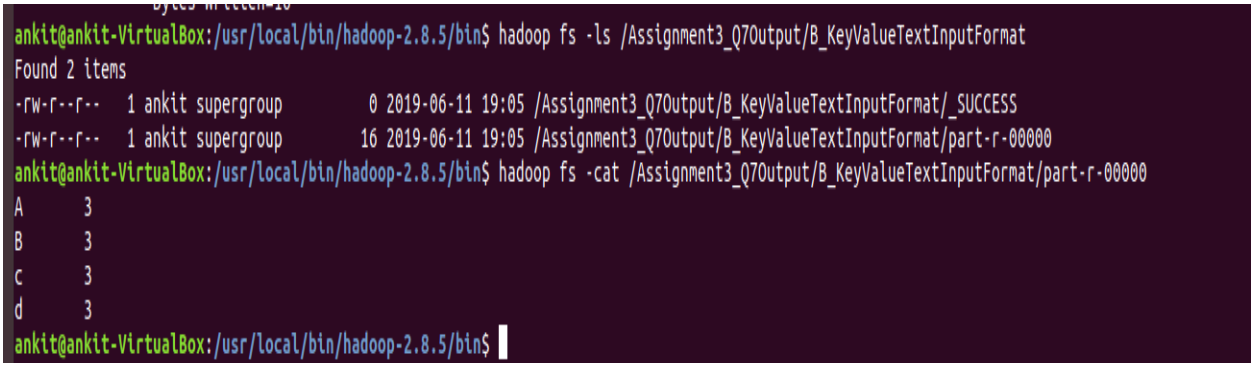
3>KeyValueTextInputFormat

Operation- Counting the number of keys

code in package KeyValueInputFormat

Output





4> FixedLengthInputFormat

5> NLineInputFormat

The code is in package NLineInputFormat

Output

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop jar /home/ankit/Downloads/Q72.jar com.hadoop.assignment3_q7.NLineInputFormat.NLIneMainMR /myEbooks/ebook.txt /Assignment3_Q7Output/C_NLineInp
utFormat
19/06/11 21:31:19 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0:8032
19/06/11 21:31:23 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
19/06/11 21:31:24 INFO input.FileInputFormat: Total input files to process : 1
19/06/11 21:31:26 INFO mapreduce.JobSubmitter: number of splits:65
19/06/11 21:31:26 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1560294229318_0002
19/06/11 21:31:29 INFO impl.YarnClientImpl: Submitted application application_1560294229318_0002
19/06/11 21:31:31 INFO mapreduce.Job: The url to track the job: http://ankit-VirtualBox:8088/proxy/application_1560294229318_0002/
19/06/11 21:31:31 INFO mapreduce.Job: Running job: job_1560294229318_0002
19/06/11 21:32:12 INFO mapreduce.Job: Job job_1560294229318_0002 running in uber mode : false
19/06/11 21:32:12 INFO mapreduce.Job:  map 0% reduce 0%
```

```
19/06/11 21:37:28 INFO mapreduce.Job:  map 89% reduce 29%
19/06/11 21:37:34 INFO mapreduce.Job:  map 91% reduce 30%
19/06/11 21:37:36 INFO mapreduce.Job:  map 92% reduce 30%
19/06/11 21:37:37 INFO mapreduce.Job:  map 94% reduce 30%
19/06/11 21:37:40 INFO mapreduce.Job:  map 95% reduce 31%
19/06/11 21:37:41 INFO mapreduce.Job:  map 97% reduce 31%
19/06/11 21:37:44 INFO mapreduce.Job:  map 98% reduce 31%
19/06/11 21:37:45 INFO mapreduce.Job:  map 100% reduce 31%
19/06/11 21:37:46 INFO mapreduce.Job:  map 100% reduce 100%
19/06/11 21:37:48 INFO mapreduce.Job: Job job_1560294229318_0002 completed successfully
19/06/11 21:37:49 INFO mapreduce.Job: Counters: 51
        File System Counters
                FILE: Number of bytes read=630848
                FILE: Number of bytes written=11701564
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=555980
                HDFS: Number of bytes written=86505
                HDFS: Number of read operations=198
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=2
        Job Counters
                Failed map tasks=14
                Killed map tasks=1
                Launched map tasks=79
                Launched reduce tasks=1
                Other local map tasks=79
                Total time spent by all maps in occupied slots (ms)=1681823
                Total time spent by all reduces in occupied slots (ms)=161950
                Total time spent by all map tasks (ms)=1681823
                Total time spent by all reduce tasks (ms)=161950
                Total vcore-milliseconds taken by all map tasks=1681823
                Total vcore-milliseconds taken by all reduce tasks=161950
                Total megabyte-milliseconds taken by all map tasks=1722186752
                Total megabyte-milliseconds taken by all reduce tasks=165836800
```

```
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -cat /Assignment3_Q7Output/C_NLineInputFormat/part-r-00000 | head
        12810
"Come   1
"Defects,"      1
"Economic       1
"HARDWOODS"     1
"Hardwoods,"    1
"Information    1
"Knees."]       1
"Our    1
"Plain  2
cat: Unable to write to output stream.
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$ hadoop fs -cat /Assignment3_Q7Output/C_NLineInputFormat/part-r-00000 | tail
you     55
you!)   1
young   32
younger 2
your    11
youth   1
yucca   1
½       1
½-inch  1
¼       1
ankit@ankit-VirtualBox:/usr/local/bin/hadoop-2.8.5/bin$
```

6> CombineFileInputFormat