List of Experiments

1. Practice on basic Linux commands.

2. Implement the following file management tasks in Hadoop:
   a. Adding files and Directories
   b. Retrieving files
   c. Deleting files
   d. Copying files from local filesystem to HDFS and vice versa.
   e. Moving files

3. Write driver code, mapper code, reducer code to count number of words in a given file(Hint: WordCount Map- Reduce Program)

4. Write a MapReduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.

5. Implement Matrix Multiplication with Hadoop Map Reduce

6. Install and run Pig then write Pig Latin scripts to Load, Store and Filter data.

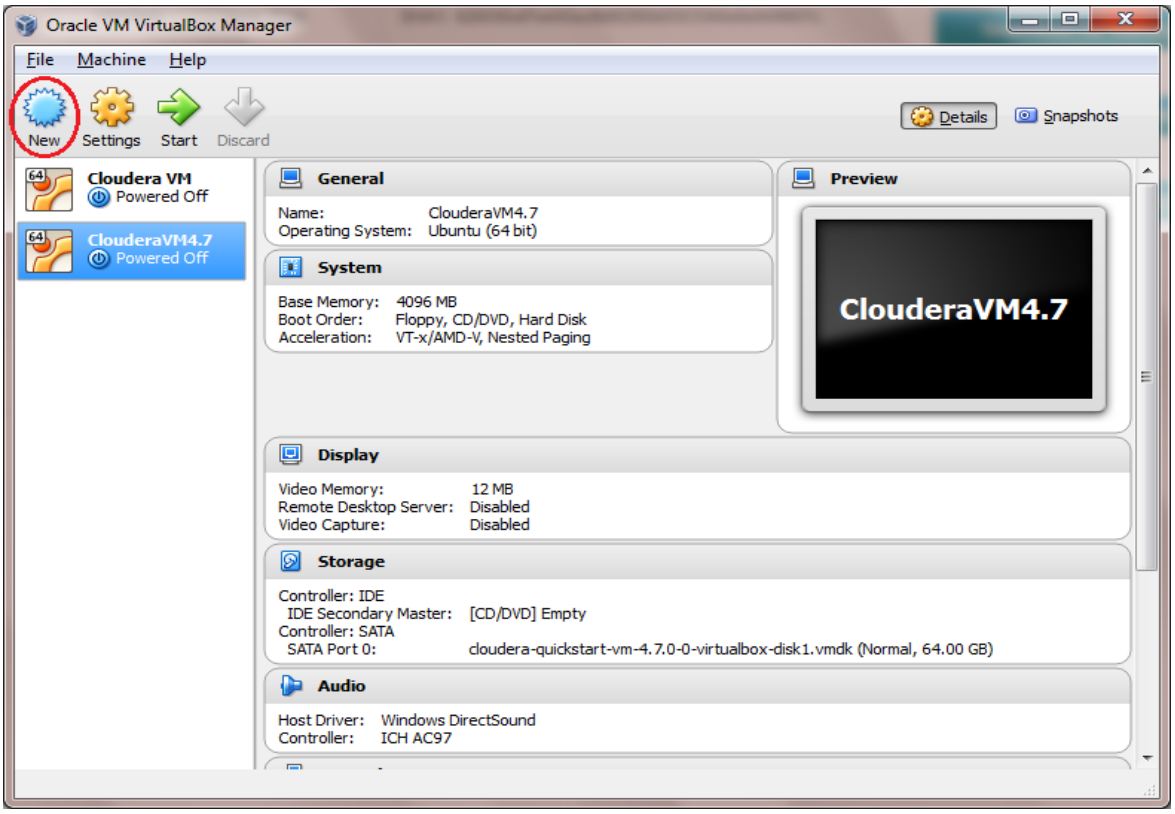
7. Write Pig Latin scripts to perform data processing operations
   a. Grouping and joining data
   b. Sorting data
   c. Combining and Splitting data

8. Implement User Defind Funcitons in Pig.

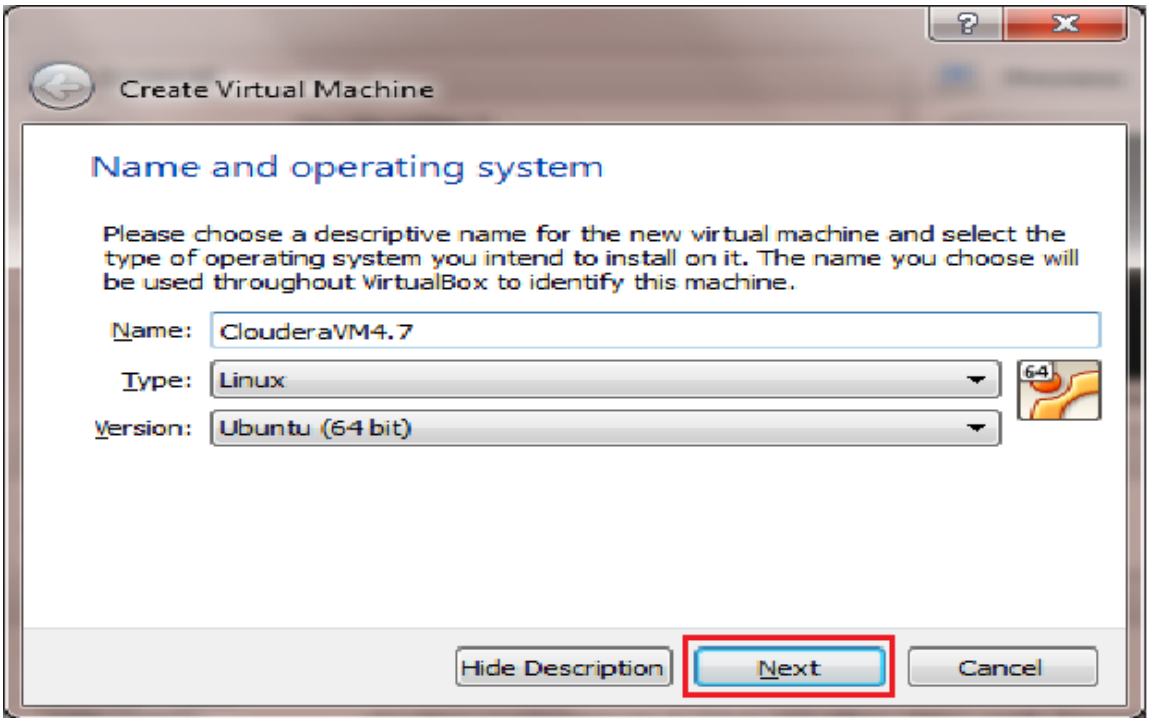
9. Install Hive and and use Hive to create databases and tables.
   a. Create and drop databases
   b. Create, alter, and drop tables
   c. Insert, Update and delete records
10. Perform data processing operations using Hive
   a. Sort and Aggregation of data
   b. Joins
11. Perform data processing operations using Hive
   a. Views
   b. Indexes
12. Implement User Defind Funcitons in Hive

Cloudera quick start VM 4.7.x Installation procedure:

1. Download and install Oracle Virtual Box from http://dlc.sun.com.edgesuite.net/virtualbox/4.3.12/VirtualBox-4.3.12-93733-Win.exe.
2. Open Oracle Virtual Box and click on **New**.

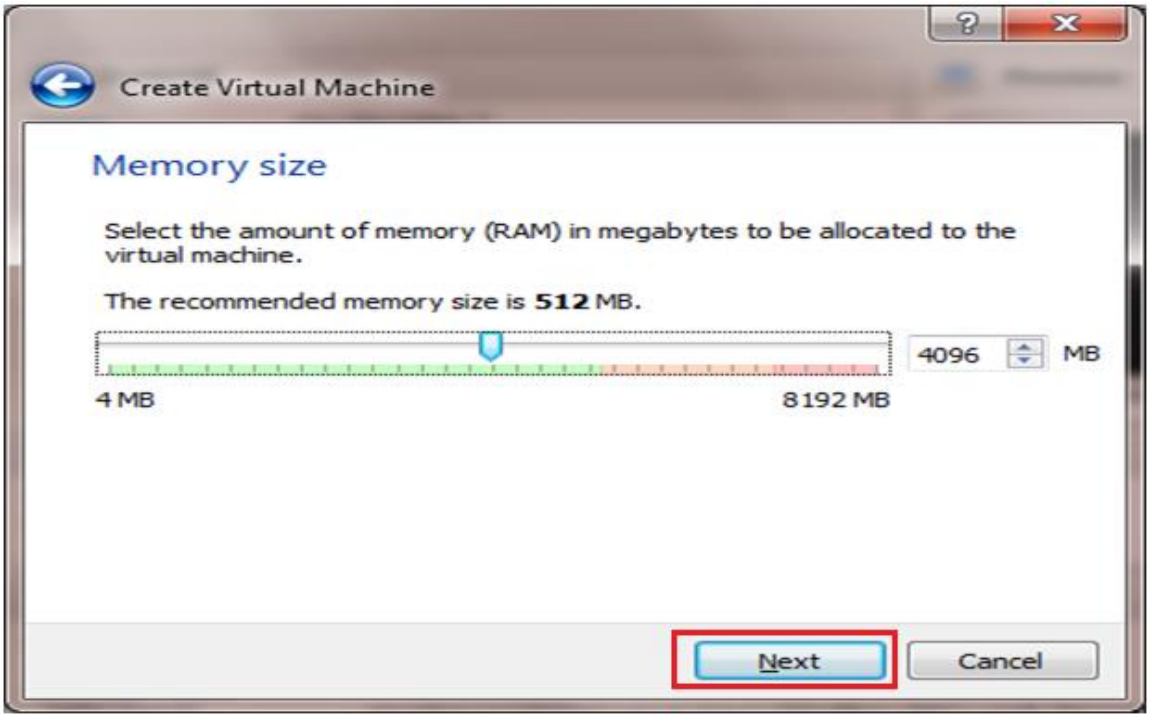


3. Give the details as given below:

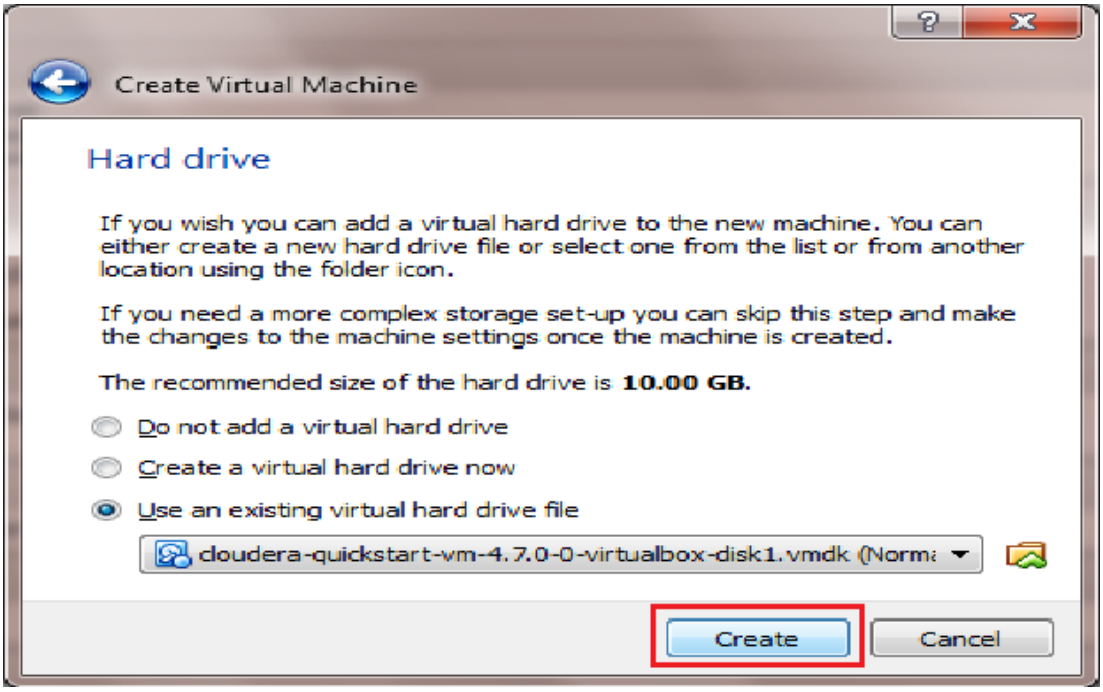


And click on **Next.**

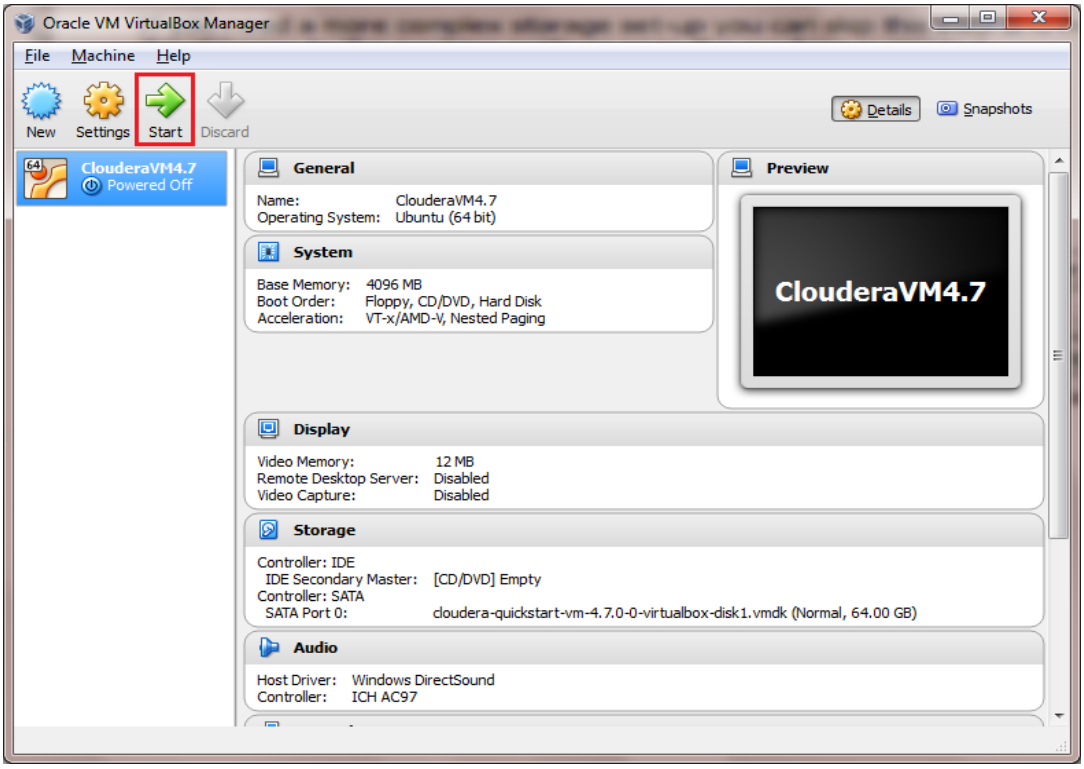
4. Set the RAM memory as given below and click on **Next**. Approximately Half of the RAM need to be allocated to Virtual Box Instance



5. Select Use an existing virtual hard drive file and click on **Create.**



6. Now, select ClouderaVM4.7 and click on **Start** button.



System requirements:

This requires a 64-bit host OS and a virtualization product that can support a 64-bit guest OS.

Better to have 8GM RAM since we are using virtual box but 4GB is also fine for practice

Double Click on the “poweroff” button and you will be accessing Cloudera Manager

Cloudera Manager UserId/Password: cloudera/cloudera

EXPERIMENT-1

System Info		
1.	date	Show the current date and time
2.	cal	Show this month's calender
3.	uptime	Show current uptime
4.	w	Display who is on line
5.	whoami	Who you are logged in as

File permission		
1.	chmod octal file	Change the permission of file to octal,which can be found separately for user,group,world by adding, • 4-read(r) • 2-write(w) • 1-execute(x)

Searching		
1.	grep pattern file	Search for pattern in file

Process management		
1.	ps	To display the currently working processes
2.	top	Display all running process

File Commands		
1.	ls	Directory listing
2.	ls -al	Formatted listing with hidden files
3.	ls -lt	Sorting the Formatted listing by time modification
4.	cd dir	Change directory to dir
5.	cd	Change to home directory
6.	pwd	Show current working directory
7.	mkdir dir	Creating a directory dir
8.	cat >file	Places the standard input into the file
9.	more file	Output the contents of the file
10.	head file	Output the first 10 lines of the file
11.	tail file	Output the last 10 lines of the file
12.	tail -f file	Output the contents of file as it grows,starting with the last 10 lines
13.	touch file	Create or update file
14.	rm file	Deleting the file
15.	rm -r dir	Deleting the directory
16.	rm -f file	Force to remove the file
17.	rm -rf dir	Force to remove the directory dir
18.	cp file1 file2	Copy the contents of file1 to file2
19.	cp -r dir1 dir2	Copy dir1 to dir2;create dir2 if not present
20.	mv file1 file2	Rename or move file1 to file2,if file2 is an existing directory

EXPERIMENT-2

2)Implement the following file management tasks in Hadoop:

- **Adding files and directories**
- **Retrieving files**
- **Deleting files**

Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.

HDFS basic Command-line file operations

1. Create a directory in HDFS at given path(s):
   Command: hadoop fs -mkdir <paths>
2. List the contents of a directory:
   Command: hadoop fs -ls <args>
3. Upload and download a file in HDFS:
   Upload:
   Command: hadoop fs -put <localsrc> <HDFS_dest_path>
   Downloa:
   Command: hadoop fs -get <HDFS_src> <localdst>
4. See contents of a file:
   Command: hadoop fs -cat <path[filename]>
5. Copy a file from source to destination:
   Command: hadoop fs -cp <source> <dest>
6. Copy a file from/To Local file system to HDFS:
   Command: hadoop fs -copyFromLocal <localsrc> URI
   Command: hadoop fs -copyToLocal [-ignorecrc] [-crc] URI <localsrc>
7. Move file from source to destination:
   Command: hadoop fs -mv <src> <dest>
8. Remove a file or directory in HDFS:
   Remove files specified as argument. Delete directory only when it is empty.
   Command: hadoop fs -rm <arg> Recursive version of delete
   Command: hadoop fs -rmr <arg>
9. Display last few lines of a file:
   Command: hadoop fs -tail <path[filename]>
10. Display the aggregate length of a file:
    Command: hadoop fs -du <path>
11. Getting help:
    Command: hadoop fs -help

Adding files and directories:

- Creating a directory
  Command: hadoop fs -mkdir input/
- Copying the files from localfile system to HDFS

Command: hadoop fs -put inp/file01 input/

Retrieving files:

Command: hadoop fs -get input/file01 localfs

Deleting files and directories:

Command: hadoop fs -rmr input/file01

Hadoop provides a set of command line utilities that work similarly to the Linux file commands.

Default directories

Local file system : **/home/cloudera**
HDFS : **/user/cloudera**

Basic file commands:

Hadoop file command take the form of

hadoop fs -cmd <args>

where **cmd** is the specific file command and **<args>** is the variable number of arguments

Example:

Command for listing files is:

hadoop fs –ls

Most common file management tasks in hadoop are—

- Adding files and directories
- Retrieving files
- Deleting files

a) Adding files and directories: Before running hadoop programs need to put the data into HDFS first .

1. **mkdir : Create a directory in HDFS at given path(s)**.

hadoop fs -mkdir <paths>

Example:

hadoop fs -mkdir /user/cloudera/myfolder1
(absolute path)
Or
hadoop fs –mkdir myfolder1
(relative path)

Create a sub directory

Example:

hadoop fs –mkdir /user/cloudera/myfolder1/subfolder1

2. **ls : List the contents of a directory.**

hadoop fs -ls <args>

Example:

hadoop fs – ls
hadoop fs –ls / (list the contents of root directory)
hadoop fs –lsr / (recursively displays entries in all subdirectories of path)
hadoop fs –ls –R
hadoop fs –lsr /user/cloudera/myfolder1

3. **put or copyFromLocal : Upload a file in HDFS**

hadoop fs -**put** localsrc dst

or

hadoop fs –**copyFromLocal** localsrc dst

Copy single src file, or multiple src files from local file system to the Hadoop distributed file system

Example

create two files in local filesystem using cat or using any editor nano or gedit

```
cat > file1
        This is Hadoop Lab
Ctrl+Z
cat > file2
        This is Bigdata Lab
Ctrl+Z
hadoop fs - put file1 /user/cloudera/myfolder1
hadoop fs -copyFromLocal file2 /user/cloudera/myfolder1/subfolder1
hadoop fs -put file3 . (put the file in the default directory
```

checking:

```
hadoop fs – lsr /user/cloudera/myfolder1
hadoop fs –ls /
```

b)Retriving files

copy files from HDFS to local filesystem.

1.Download: get or copyToLocal :Copies/Downloads files to the local file system

hadoop fs –**get** hdfs_src localdst

or

hadoop fs - **copyToLocal** hdfs_src localdst

Example:

```
hadoop fs -get /user/clooudera/myfolder1/file1 .
hadoop fs -copyToLocal /user/cloudera/myfolder1/file2 .
```

Another way to access the data is to display it. We can use the Hadoop filecommand with unix pipes to send its output for further processing.

```
hadoop fs –cat file1
hadoop fs –cat file1 | head
hadoop fs –tail file1 (display the last 1 kb of file1)
```

c) Deleting files

Hadoop command for removing files is **rm**

Example :

```
hadoop fs -rm file1
hadoop fs -rmr myfolder1 (remove directory recursively)
```

Looking Up Help

A list of hadoop file commands together with the usage and description of each command can see by using **help** command.

hadoop fs -**help** cmd

Example :

hadoop fs –help ls

1. cp : Copy a file from source to destination

hadoop fs -**cp** <source> <dest>

Example:

hadoop fs -cp /user/cloudera/file1 /user/cloudera/myfolder1

2.mv : Move file from source to destination.

Note:- Moving files across filesystem is not permitted.

hadoop fs **–mv** <src> <dest>

Example:

hadoop fs -mv /user/cloudera/file1 user/cloudera/myfolder1

3. du : Shows disk usage, in bytes, for all the files which match path; filenames are reported with the full HDFS protocol prefix.

hadoop fs -**du** <path>

Example:

hadoop fs -du /user/cloudera

4. dus : Like -du, but prints a summary of disk usage of all files/directories in the path.

hadoop fs - **dus** <path>

Example:

hadoop fs -dus /user/cloudera

Moving files across filesystem

5. moveFromLocal : files from local file system to the Hadoop distributed file system

hadoop fs –**moveopyFromLocal** localsrc dst

Move single src file, or multiple src files from local file system to the Hadoop distributed file system

Example

create afile in local filesystem using cat or using any editor nano or gedit

```
cat > file4
        This is Hadoop and BigdataLab
Ctrl+Z
```

hadoop fs -moveFromLocal file4 /user/cloudera/myfolder1/subfolder1

checking:

hadoop fs – lsr /user/cloudera/myfolder1

hadoop fs –ls .

6. moveToLocal: copy files from HDFS to local filesystem.

hadoop fs - **moveToLocal** hdfs_src localdst

Example:

hadoop fs -moveToLocal /user/cloudera/myfolder1/file4 .

7. Chmod : To change permissions of files/directories

hadoop fs -**chmod** 777 filename/directory name

Example:

hadoop fs –chmod 666 /user/cloudera/file2

8.getmerge: concatenates the files in the source directory into the destination file.

hadoop fs -**getmerge** <src> <localdst> [addnl]

The addnl option is for adding new line character at the end of each file.

Example :

hadoop fs –getmerge file1 file2 mergfile

9. chown : used to change the ownership of files. The -R option can be used to recursively change the owner of a directory structure.
hadoop fs -**chown** [-R] <NewOwnerName>[:NewGroupName] <file or dir name>

10. Expunge : Used to empty the trash.
hadoop fs -**expunge**

11.setrep: used to change the replication factor of a file.
hadoop fs -**setrep** -w 4 /user/cloudera /file1

12. touchz: creates a zero byte file. This is similar to the touch command in unix.
hadoop fs -**touchz** /user/cloudera/filename
Example :
hadoop fs –touchz /user/cloudera/file0