ASSIGNMENT 1.2- BASIC UNIX SELL

Introduction and Assumptions-

This a project that implements a simulation of Unix shell using C language . The shell is made with the capability to handle five internal and five external commands. The shell is supposed to be run on a linux system and not on any other OS .

The shell also needs all the running binaries associated with it to be placed at a single directory/file and not in multiple places .That will result in errors.

All the commands are provided with at least two corner cases checking possibilities. These can be seen when the program is run on the system . Proper error message will be flashed on the screen in that case.

Compilation of the program-

The program can be compiled using the make command . The makefile will place all the running binaries of the c programs in the bin directory. And all the source codes will be present in the directory the user has provided.

Internal Commands provided and implemented in the shell are:-

Command	Option 1	Option 2
echo	-n	-e
history	-c	-d
cd	-P	-L
exit	default	-s
pwd	-l	-p

These are internal commands . Means they are coded inside the shell's program. Hence ,no external requirements are needed to execute this commands.

External Commands provided and implemented in the shell are:-

Command	Option 1	Option 2
rm	-i	-d
mkdir	-p	-m
date	-R	-r
cat	-n	-b
ls	-q	-a

These are the external commands. Means they are not present within the shell but included in it. So, they will require the external codes to be present at the time of execution to get run successfully.

Now we will look into the commands and the options provided in them-

echo- the command is used to get the arguments passed onto it get in the standard output .

The format of echo :– echo -n <args>

:- echo -e<args>

Option 1:- -n:- It don't prints the newline character

Option 2:- -e:- It prints the newline character

Some escape sequences that are provided in the shell-

\a,\n,\\,\0,\b

history- This command is used to output the history of the current shell session.

The format of history command-

history -c <args>

history -d <args>

Option 1:- -c:-clears the history

Option 2:- -d:-removes the history at the offset provided by the user.

cd- This command is used to change the current working directory.

The format of cd command-

cd -P [dir. path]

cd -L [dir. path]

Option 1:- -P:-symlink and cd are resolved into absolute path

Option 2:- -L:-symlinks are not resolved

We can use .. to get into the parent directory and ~ to get the cd set to default dir.

exit- This command is used to simply exit .

Format of the exit command-

exit [returning value]

exit -s [returning value]

Option 1:- default case is the normal exit . 0 will be returned when the shell terminates properly.

Option 2:- -s :- the message that is shown by the shell when exit is done is not shown with this flag.

pwd-This command is used to get the present working directory of the user.

The format of the pwd command-

pwd -L

pwd -P

Option 1:- symlink is resolved to go to absolute path

Option 2:-symlinks are not resolved

rm- This command is used to remove the files provided by the user.

The format of the rm command-

rm -i <file1><file2>

rm -d <file1><file2>

Option 1:- -i:- a confirmation is requested

Option 2:- -d:-the present empty directories are removed

mkdir-This command is used to create folder/directories.

The format of the mkdir command-

mkdir -m <requiredpath>

mkdir -p<requiredpath>

Option 1:- -p:- when there is no parent directory it creates one.

Option 2:- -m:- to set some permissions on the folder being created

date- This command is used to get the current the date present with our system.

The format for date command-

date -R

date -r [provided path/provided file]

Option 1:- -r:- to print the provided path's last modified date.

Option 2:- -R:-to print the current date of the system we are working on.

cat- This command concatenates the output provided in the standard output in the sequential manner.

The format of the cat command:-

cat <file provided>

cat -n <file provided>

cat -b<file provided>

Option 1:- -n :-It does numbering

Option 2:- -b:-It also does numbering but leaves the one which are provided as new lines

ls- This command is used to list all the folders and directories in the current working directory of the user.

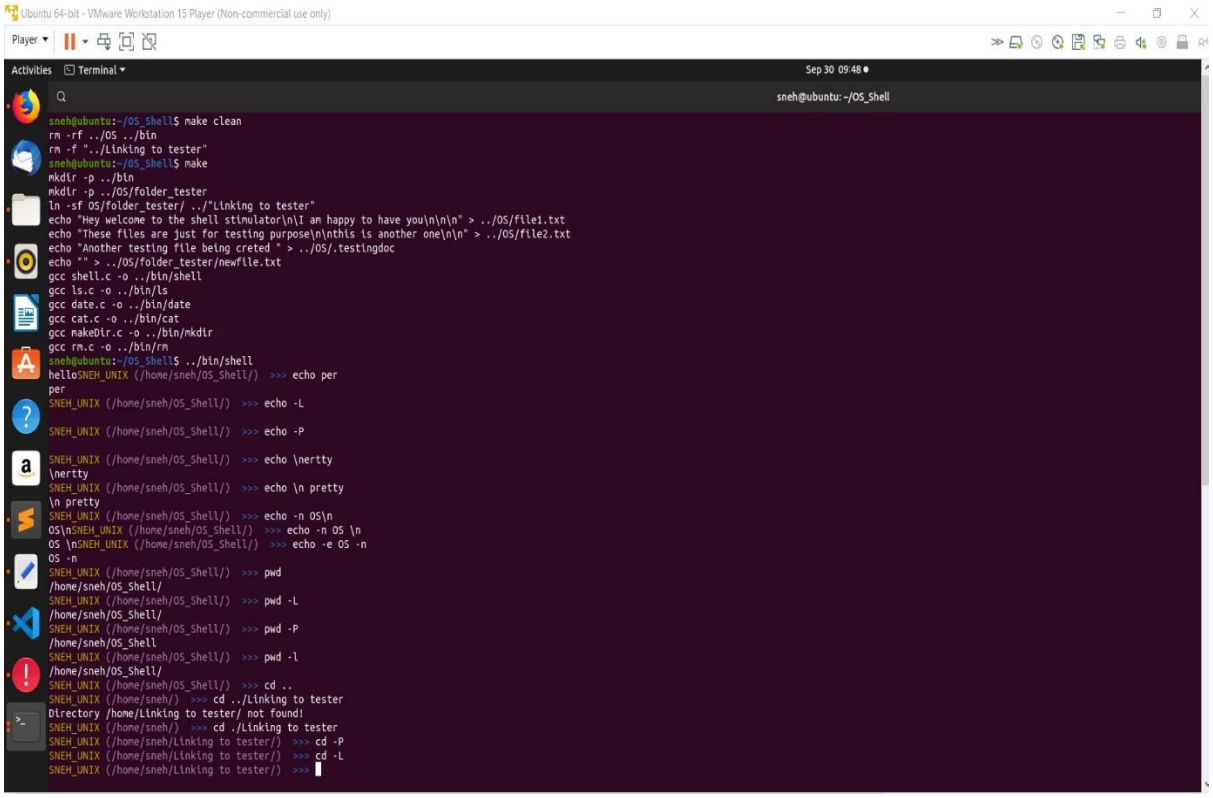
The format of ls command-

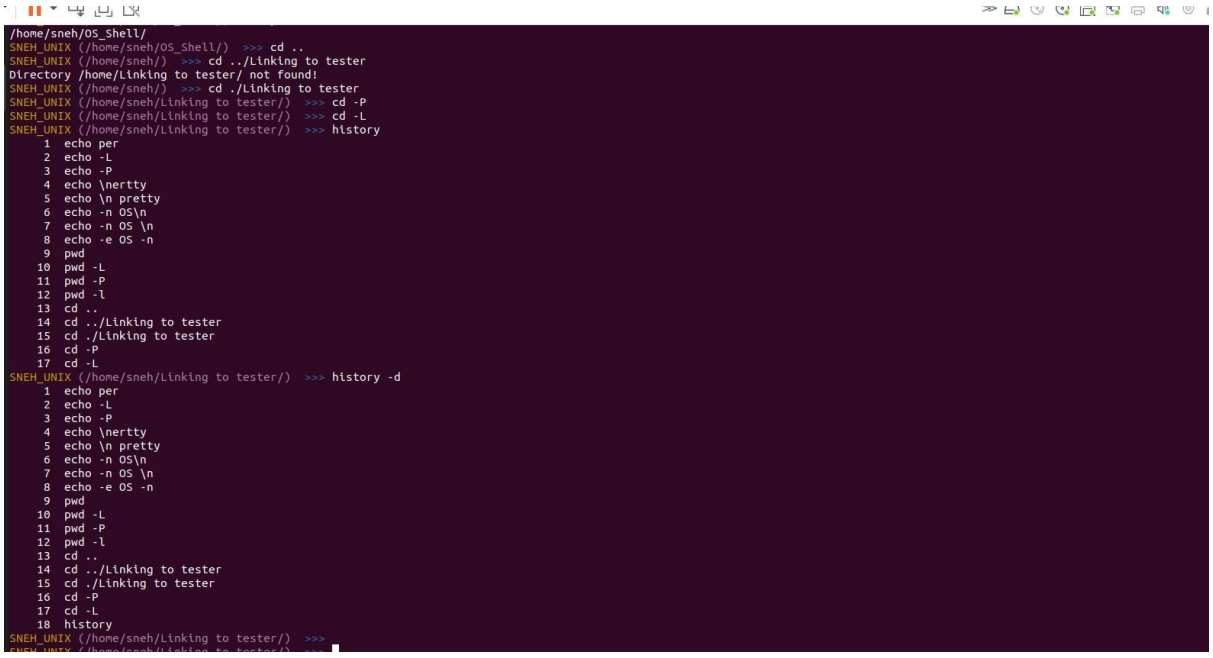
ls -a

ls -Q

Option 1:- -Q:-Quotation marks are provided around the names of the folders in the directory

Option 2:- -a:- It is used to shows the folders which are normally hidden





```
SNEH_UNIX (/home/sneh/Linking to tester/)  >>> history -d
    1  echo per
    2  echo -L
    3  echo -P
    4  echo \nertty
    5  echo \n pretty
    6  echo -n OS\n
    7  echo -n OS \n
    8  echo -e OS -n
    9  pwd
   10  pwd -L
   11  pwd -P
   12  pwd -l
   13  cd ..
   14  cd ../Linking to tester
   15  cd ./Linking to tester
   16  cd -P
   17  cd -L
   18  history
SNEH_UNIX (/home/sneh/Linking to tester/)  >>>
SNEH_UNIX (/home/sneh/Linking to tester/)  >>> history -c
SNEH_UNIX (/home/sneh/Linking to tester/)  >>> history
    1  history -c
SNEH_UNIX (/home/sneh/Linking to tester/)  >>> date
Wed Sep 30 09:54:21 PDT 2020
SNEH_UNIX (/home/sneh/Linking to tester/)  >>> date -R
Wed, 30 Sep 2020 09:54:25 -0700
```

```
SNEH_UNIX (/home/sneh/)  >>> exit
The Shell Ends sneh@ubuntu:~/OS_Shell$ ../bin/shell
helloSNEH_UNIX (/home/sneh/OS_Shell/)  >>> date -r OS/test1.txt -R
Invalid Path.
SNEH_UNIX (/home/sneh/OS_Shell/)  >>> cd ..
SNEH_UNIX (/home/sneh/)  >>> date -R
Wed, 30 Sep 2020 09:57:33 -0700
SNEH_UNIX (/home/sneh/)  >>> date -r OS/file1.txt
Wed Sep 30 09:36:34 PDT 2020
SNEH_UNIX (/home/sneh/)  >>> mkdir newOS
SNEH_UNIX (/home/sneh/)  >>> ls
addNums  addNums.c  addNums.i  addNums.s  aveargе.c  average  average.c  bin  CLionProjects  Desktop  Docum
wOS  openjdk-8_8u252-b09.orig  openjdk-8_8u252-b09.orig.tar.xz  openjdk-9-9  openjdk-9-9~b114  openjdk.tar
SNEH_UNIX (/home/sneh/)  >>> mkdir -m wer
Not a valid mode !
SNEH_UNIX (/home/sneh/)  >>> mkdir newOS/testdir hello/parent dirOS
mkdir: Cannot create the directory hello/parent !
SNEH_UNIX (/home/sneh/)  >>> ls newOS
```

```
SNEH_UNIX (/home/sneh/)  >>> ls
addNums  addNums.c  addNums.i  addNums.s  aveargе.c  average  average.c  bin  CLionProjects  Desktop  dirOS  D
sic  newOS  openjdk-8_8u252-b09.orig  openjdk-8_8u252-b09.orig.tar.xz  openjdk-9-9  openjdk-9-9~b114  openjdk.
SNEH_UNIX (/home/sneh/)  >>> ls -o
addNums  addNums.c  addNums.i  addNums.s  aveargе.c  average  average.c  bin  CLionProjects  Desktop  dirOS  D
sic  newOS  openjdk-8_8u252-b09.orig  openjdk-8_8u252-b09.orig.tar.xz  openjdk-9-9  openjdk-9-9~b114  openjdk.
SNEH_UNIX (/home/sneh/)  >>> ls -p
addNums  addNums.c  addNums.i  addNums.s  aveargе.c  average  average.c  bin  CLionProjects  Desktop  dirOS  D
sic  newOS  openjdk-8_8u252-b09.orig  openjdk-8_8u252-b09.orig.tar.xz  openjdk-9-9  openjdk-9-9~b114  openjdk.
SNEH_UNIX (/home/sneh/)  >>> ls \n
An error was encountered !

SNEH_UNIX (/home/sneh/)  >>> ls hello
An error was encountered !

SNEH_UNIX (/home/sneh/)  >>> ls bin
cat  date  ls  mkdir  rm  shell
```

Important Note-

1. Please stick to the commands that are being provided in this doc and the format of the commands. Doing anything other than this will result in errors.
2. The external command mkdir and the internal command cd are path and file/directory dependent. If the file is not compiled in the rightful manner and the right working environment . These commands will fail in execution . Resulting in error.
3. A bin directory is a must on the user's disk so that the proper functioning of the program can be done.
4. The shell is capable of setting it's working directory as that provided by the user. No hard and fast rule is required to set the current working directory of the unix shell.