Concepts of Operating System
Assignment 2
Part A

What will the following commands do?

echo "Hello, World!"

This command print hello world.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ echo "Hello,world!"
Hello,world!
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ Z
```

name="Productive"

This command store “Productive” string int name variable.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ name="Productive"
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ echo $name
Productive
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

touch file.txt

This command creats file .txt file

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ touch file.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls
docs  docs.zip  docs2  file.txt  file1.txt  file2.txt  file3.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

ls -a

This commands list out all files including hidden files.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls -a
.  ..  docs  docs.zip  docs2  file.txt  file1.txt  file2.txt  file3.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

rm file.txt

This command removes files from directories.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls -a
.  ..  docs  docs.zip  docs2  file.txt  file1.txt  file2.txt  file3.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ rm file.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls
docs  docs.zip  docs2  file1.txt  file2.txt  file3.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

cp file1.txt file2.txt
This command copy contents of file1.txt to file2.txt. If file2.txt is not created it will create file.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ more file1.txt
Hello World !!!
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cp file1.txt file2.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ more file2.txt
Hello World !!!
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

mv file.txt /path/to/directory/
Moves the file into specified path.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$ ls
 data.txt   directory1   duplicate.txt   file2.txt   fruit.txt   input.txt   numbers.txt   output.txt  '~'
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$ mv numbers.txt /home/cdac/LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$ cd /home/cdac/LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls
docs  docs.zip  docs2  file1.txt  file2.txt  file3.txt  numbers.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

chmod 755 script.sh
This commands gives the write,execute and read permissions to owner.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls -ltr *file1.txt*
-rwxr-xr-x 1 cdac cdac 16 Aug 30 15:54 file1.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

grep "pattern" file.txt

```
I am Vaishnodevi Ghodake.
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ grep "World" file1.txt
Hello World !!!
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

kill PID
It is used to terminate the process by their process ID.

mkdir mydir && cd mydir && touch file.txt && echo "Hello, World!" > file.txt && cat file.txt
This command is creating mydir directory and in that directory file.txt file is creating and output of echo "Hello, World!" is stored into file.txt.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ mkdir mydir && cd mydir && touch file.txt && echo "Hello, World!" > file.txt && cat file.txt
Hello, World!
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/mydir$
```

ls -l | grep ".txt"

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls -l | grep ".txt"
-rwxr-xr-x 1 cdac cdac   42 Aug 30 16:26 file1.txt
-rw-r--r-- 1 cdac cdac   16 Aug 30 15:55 file2.txt
-rw-r--r-- 1 cdac cdac    0 Aug 28 21:25 file3.txt
-rw-r--r-- 1 cdac cdac   51 Aug 28 23:15 numbers.txt
```

cat file1.txt file2.txt | sort | uniq

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cat file1.txt file2.txt | sort | uniq
apple
banana
cherry
cherry.
date
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ more file1.txt
apple
banana
cherry.
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ more file2.txt
banana
date
cherry
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

ls -l | grep "^d"

Listing out the all the files which is starting from d.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls -l | grep "^d"
drwxr-xr-x 3 cdac cdac 4096 Aug 30 15:59 docs
drwxr-xr-x 3 cdac cdac 4096 Aug 28 22:32 docs2
drwxr-xr-x 2 cdac cdac 4096 Aug 30 21:56 mydir
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

grep -r "pattern" /path/to/directory/

This command will search for the pattern within the directory and subdirectory recursively

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ grep -r "apple" /home/cdac/LinuxAssignment/
/home/cdac/LinuxAssignment/docs/fruit.txt:apple
/home/cdac/LinuxAssignment/docs/fruit.txt:apple
/home/cdac/LinuxAssignment/docs/fruit.txt:apple
/home/cdac/LinuxAssignment/docs/fruit.txt:apple
/home/cdac/LinuxAssignment/file1.txt:apple
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

cat file1.txt file2.txt | sort | uniq –d

Cat command concatenate two files and sort command arrange the lines in alphabetical order.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cat file1.txt file2.txt| sort | uniq -d
banana
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cat file1.txt
apple
banana
cherry.
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cat file2.txt
banana
date
cherry
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

chmod 644 file.txt
This command will give permissions to owner - 4(read)+2(write) and to group- 4(read) and to other - 4(read)

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls -l "file1.txt"
-rw-r--r-- 1 cdac cdac 21 Aug 31 01:36 file1.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

cp -r source_directory destination_dire

Copies the source dir to destination dir with sub directories of source dir

```
cdac@LAPTOP-CVPV6KG4:~$ cp -r LinuxAssignment destination_dir
cdac@LAPTOP-CVPV6KG4:~$ cd LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls -ltr
total 28
-rw-r--r-- 1 cdac cdac    0 Aug 28 21:25 file3.txt
-rw-r--r-- 1 cdac cdac  160 Aug 28 22:23 docs.zip
drwxr-xr-x 3 cdac cdac 4096 Aug 28 22:32 docs2
-rw-r--r-- 1 cdac cdac   51 Aug 28 23:15 numbers.txt
drwxr-xr-x 3 cdac cdac 4096 Aug 30 15:59 docs
drwxr-xr-x 2 cdac cdac 4096 Aug 30 21:56 mydir
-rw-r--r-- 1 cdac cdac   21 Aug 31 01:36 file1.txt
-rw-r--r-- 1 cdac cdac   19 Aug 31 01:38 file2.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cd destination_dir
-bash: cd: destination_dir: No such file or directory
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cd ..
cdac@LAPTOP-CVPV6KG4:~$ cd destination_dir
cdac@LAPTOP-CVPV6KG4:~/destination_dir$ ls -l
total 4
drwxr-xr-x 5 cdac cdac 4096 Aug 31 19:27 LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~/destination_dir$ cd LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~/destination_dir/LinuxAssignment$ ls -i
40148 docs  40145 docs.zip  40146 docs2  40163 file1.txt  40162 file2.txt  40158 file3.txt  40159 mydir  40161 numbers.txt
cdac@LAPTOP-CVPV6KG4:~/destination_dir/LinuxAssignment$ ls -l
total 28
drwxr-xr-x 3 cdac cdac 4096 Aug 31 19:27 docs
-rw-r--r-- 1 cdac cdac  160 Aug 31 19:27 docs.zip
drwxr-xr-x 3 cdac cdac 4096 Aug 31 19:27 docs2
-rw-r--r-- 1 cdac cdac   21 Aug 31 19:27 file1.txt
-rw-r--r-- 1 cdac cdac   19 Aug 31 19:27 file2.txt
-rw-r--r-- 1 cdac cdac    0 Aug 31 19:27 file3.txt
drwxr-xr-x 2 cdac cdac 4096 Aug 31 19:27 mydir
-rw-r--r-- 1 cdac cdac   51 Aug 31 19:27 numbers.txt
```

Part B

Identify True or False:

1. ls is used to list files and directories in a directory.

True

```
cdac@LAPTOP-CVPV6KG4:/$ cd home
cdac@LAPTOP-CVPV6KG4:/home$ ls
cdac
cdac@LAPTOP-CVPV6KG4:/home$ cd _
```

2. mv is used to move files and directories.

True

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ mv file5.txt /home/cdac
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ cd /home/cdac
cdac@LAPTOP-CVPV6KG4:~$ ls -ltr
total 4
-rw-r--r-- 1 cdac cdac    0 Aug 28 18:43 file1.txt
-rw-r--r-- 1 cdac cdac    0 Aug 28 21:25 file5.txt
drwxr-xr-x 4 cdac cdac 4096 Aug 30 15:04 LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~$
```

3. cd is used to copy files and directories.

False. Cd is used to change the directories

```
cdac@LAPTOP-CVPV6KG4:~$ cd LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

4. pwd stands for "print working directory" and displays the current directory.
True

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

5. grep is used to search for patterns in files.
True

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$ grep "one" data.txt
one
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$
```

6. chmod 755 file.txt gives read, write, and execute permissions to the owner, and read and execute permissions to group and others.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$ chmod 755 duplicate.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$ ls -ltr "duplicate.txt"
-rwxr-xr-x 1 cdac cdac 16 Aug 28 23:47 duplicate.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$
```

7. mkdir -p directory1/directory2 creates nested directories, creating directory2 inside directory1
if directory1 does not exist.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs$ cd directory1
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs/directory1$ ls
directory2
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/docs/directory1$
```

8. rm -rf file.txt deletes a file forcefully without confirmation.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls
docs  docs.zip  docs2  file1.txt  file2.txt  file3.txt  file4.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ rm -rf file4.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$ ls
docs  docs.zip  docs2  file1.txt  file2.txt  file3.txt
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment$
```

Identify the Incorrect Commands:
1. chmodx is used to change file permissions.
This is incorrect. Chmod is correct command.

2. cpy is used to copy files and directories.
This is incorrect. cp is used to copy files and directories.

3. mkfile is used to create a new file.
This is incorrect.touch command isused to create file.

4. catx is used to concatenate files.
This incorrect. Cat command is correct.

5. rn is used to rename files.
This is incorrect. mv is used to rename files.

Part C
Question 1: Write a shell script that prints "Hello, World!" to the terminal.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat hello_world
#!/bin/bash

echo "Hello World!!!"

cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano hello_world
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash hello_world
Hello World!!!
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 2: Declare a variable named "name" and assign the value "CDAC Mumbai" to it. Print thevalue of the variable.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano name
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash name
CDAC Mumbai
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat name
#!/bin/bash
name="CDAC Mumbai"
echo $name

cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 3: Write a shell script that takes a number as input from the user and prints it.
\

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano number
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash number
Enter the number
10
10
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat number
#!/bin/bash

echo "Enter the number"
read NUM1
echo $NUM1

cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 4: Write a shell script that performs addition of two numbers (e.g., 5 and 3) and prints the result.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano addition
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash addition
Enter the num1
5
enter the num2
3
addition of two number is 8
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat addition
echo Enter the num1
read num1
echo enter the num2
read num2
echo addition of two number is $((num1+num2))



cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 5: Write a shell script that takes a number as input and prints "Even" if it is even, otherwise prints "Odd".

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano even
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash even
Enter the number
4
4 is even
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash even
Enter the number
5
5 is odd
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat even
echo Enter the number
read num

if [ $((num%2)) -eq 0 ]
then
echo $num is even
else
echo $num is odd
fi

cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 6: Write a shell script that uses a for loop to print numbers from 1 to 5.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano for
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash for
1
2
3
4
5
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat for
for a in 1 2 3 4 5
do
echo $a
done
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 7: Write a shell script that uses a while loop to print numbers from 1 to 5.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano while
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash while
1
2
3
4
5
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat while
a=1
while [ $a -le 5 ]
do
echo $a
a=$((a+1))
done

cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 8: Write a shell script that checks if a file named "file.txt" exists in the current directory. If it does, print "File exists", otherwise, print "File does not exist".

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano find
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash find
File exist
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat find
if [ -f "addition" ]
then
echo File exist
else
echo File does not exist
fi


cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano find
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash find
File does not exist
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat find
if [ -f "file.txt" ]
then
echo File exist
else
echo File does not exist
fi


cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 9: Write a shell script that uses the if statement to check if a number is greater than 10 and prints a message accordingly.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ nano greater_num
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash  greater_num
Enter a number
2
2 is less than 10
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash  greater_num
Enter a number
8
8 is less than 10
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash  greater_num
Enter a number
11
11 is greater than 10
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash  greater_num
Enter a number
32
32 is greater than 10
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat greater_num
echo Enter a number
read num
if [ $num -gt 10 ]
then
echo $num is greater than 10
else
echo $num is less than 10
fi

cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```

Question 10: Write a shell script that uses nested for loops to print a multiplication table for numbers from 1 to 5. The output should be formatted nicely, with each row representing a number and each column representing the multiplication result for that number.

```
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ bash multiplication
        1       2       3       4       5
------------------------------
1 |     1       2       3       4       5
2 |     2       4       6       8       10
3 |     3       6       9       12      15
4 |     4       8       12      16      20
5 |     5       10      15      20      25
cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$ cat multiplication
echo  -e " \t1\t2\t3\t4\t5"
echo "------------------------------"

for i in {1..5}
do
    echo -e -n "$i |\t"

      for j in {1..5}
       do
         echo -e -n "$((i*j))\t"
       done
     echo
done

cdac@LAPTOP-CVPV6KG4:~/LinuxAssignment/shellscript$
```