Concepts of Operating System

Assignment 2

Part A

Q.1] What will the following commands do?

-->>

1. echo "Hello, World!"

   --> This command will print Hello, World!"

2. name="Productive"

   -->> The variable "name" would get the value "Productive", and

   we can refer it with $name _ {so we will get the value of name i.e

"Productive" }

3. touch file.txt

   -->> This command will create an empty file with name file.txt

4. ls -a

   -->> This command will show the list of all files & directories in the current Directory & the hidden files as well.

5. rm file.txt

   -->> This command helps in deleting "file.txt" file & we must be carefull as this is irreversible.

6. cp file1.txt file2.txt

   -->> This command copies the content of file1.txt to file2.txt

7. mv file.txt /path/to/directory/

   -->> This command will move the file.txt to the directory.

8. chmod 755 script.sh

-->> This command will change the permission of file "script.sh" to 755 __{ 755 is -> Owner, Group & Others can read, write & execute the permissions. }

9. grep "pattern" file.txt

   -->> This command will search for string "pattern" in file.txt & will print the lines that contain this string on terminal.

10. kill PID

    -->> This command sends a signal to process with ID PID, which tells it to stop running. PID is the number assigned to the process we want to target. Like, kill 1234 would stop the process with ID 1234.

11. mkdir mydir && cd mydir && touch file.txt && echo "Hello, World!" > file.txt && cat file.txt

    -->> mkdir will create a new directory named _ "mydir". && cd mydir command will allow changes into mydir directory. &&

touch file.txt will create a empty file named file.txt .

&&

echo "Hello,World!" > file.txt command will write a text

Hello,World! into the file.txt .

&&

cat file.txt command will Display the content of the file .

{&& operator makes the multiple commands work together.}

12. ls -l | grep ".txt"

-->> ls -l | grep ".txt" this command will display the deatiled list of files specifically the files of .txt will be displayed.

13. cat file1.txt file2.txt | sort | uniq

-->> This command concatenates the content of file1.txt & file2.txt, then it sorts the combined output & displays it without duplicate lines.

14. ls -l | grep "^d"

-->> This command lists directories only in the current directory by filtering ls -l output and where the first character "d" (indicates a directory).

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

    -->> This command recursively searches for the string "pattern" within all files in the specified directory.

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

    -->> This command concatenates file1.txt & file2.txt then sorts the combined output, & displays only duplicate lines.

17. chmod 644 file.txt

    -->> This command sets the permissions of file.txt to 644, this means the owner can read & write the file, while the group & others can only read it.

18. cp -r source_directory destination_directory

    -->> This command copies the source directory & all its contents

recursively to destination directory.

19. find /path/to/search -name "*.txt"

    -->> This command searches for files with a .txt extension under the specified path & its subdirectories.

20. chmod u+x file.txt

    -->> This command adds execute permissions for the file owner (the user) on file.txt

21. echo $PATH

    -->> This command displays the current value of the PATH environment variable, which shows the directories & where the system looks for executable files.

Part B

Q.1) Identify True or False:

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

-->> **True.**

2. mv is used to move files and directories.

-->> **True.**

3. cd is used to copy files and directories.

-->> **False, cd is used to change directories, and not used to copy files & directories. The "cp" command is used for copying.**

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

-->> **True.**

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

-->> **True.**

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

-->> **True.**

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

-->> **True.**

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

-->> **True.**

Q.2) Identify the Incorrect Commands:

1. chmodx is used to change file permissions.

-->> "chmod" is used to change the file permissions, {chmodx is incorrect.}

2. cpy is used to copy files and directories.

-->> "cp" is the command used to copy files & directories, {cpy is incorrect.}

3. mkfile is used to create a new file.

-->> "touch filename" is the standard command/way to create a new file, and also it can be created by "echo "" > filename", {mkfile is incorrect.}

4. catx is used to concatenate files.

-->> cat is used to concatenate,{catx is incorrect.}

5. rn is used to rename files.

-->> **mv is used to rename the files,{rn is incorrect.}**

Part C

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

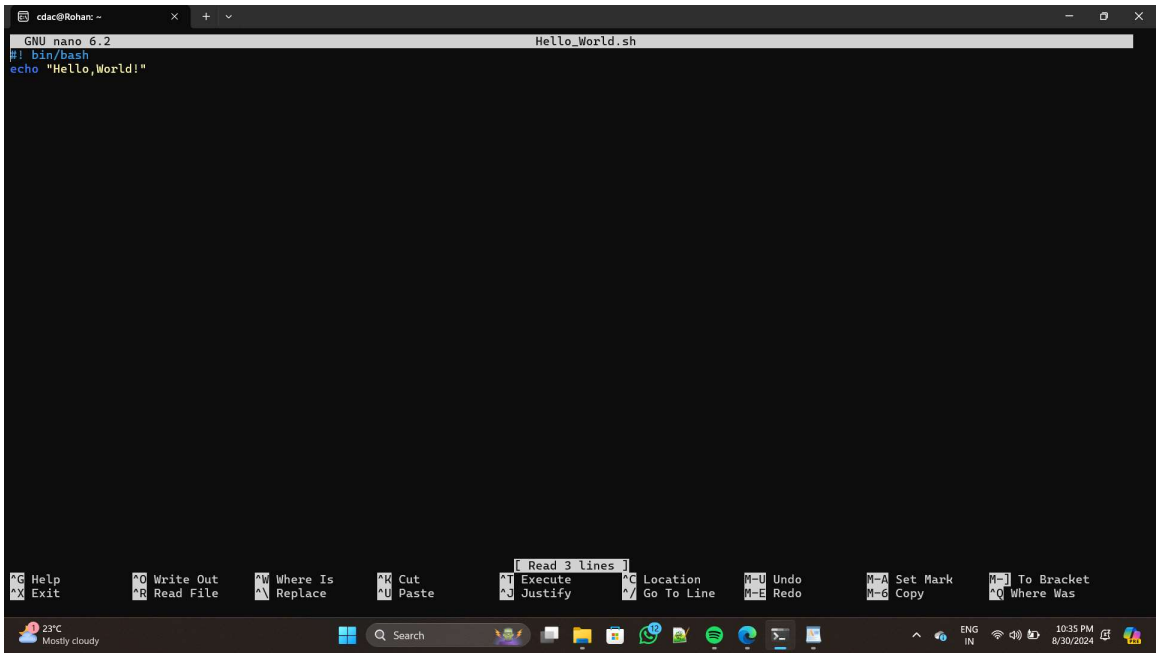
-->>

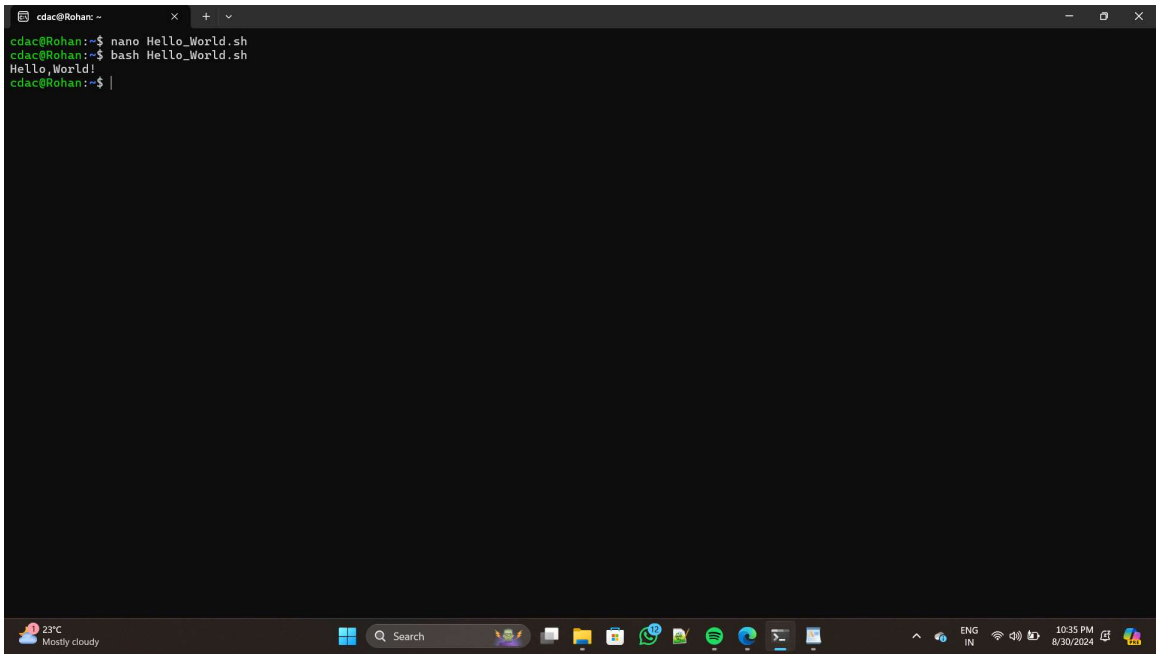
nano Hello_World.sh

#! bin/bash

echo "Hello_World!"

bash Hello_World.sh





Question 2: Declare a variable named "name" and assign the value

"CDAC Mumbai" to it. Print the value of the variable.

-->>

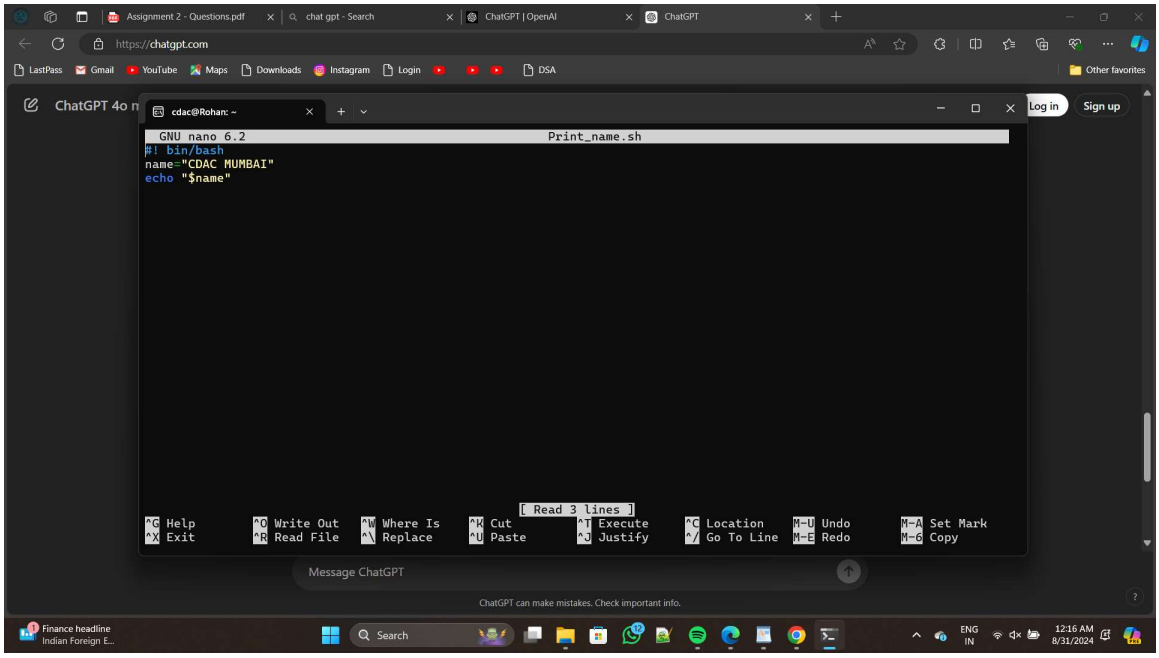
nano Print_name.sh

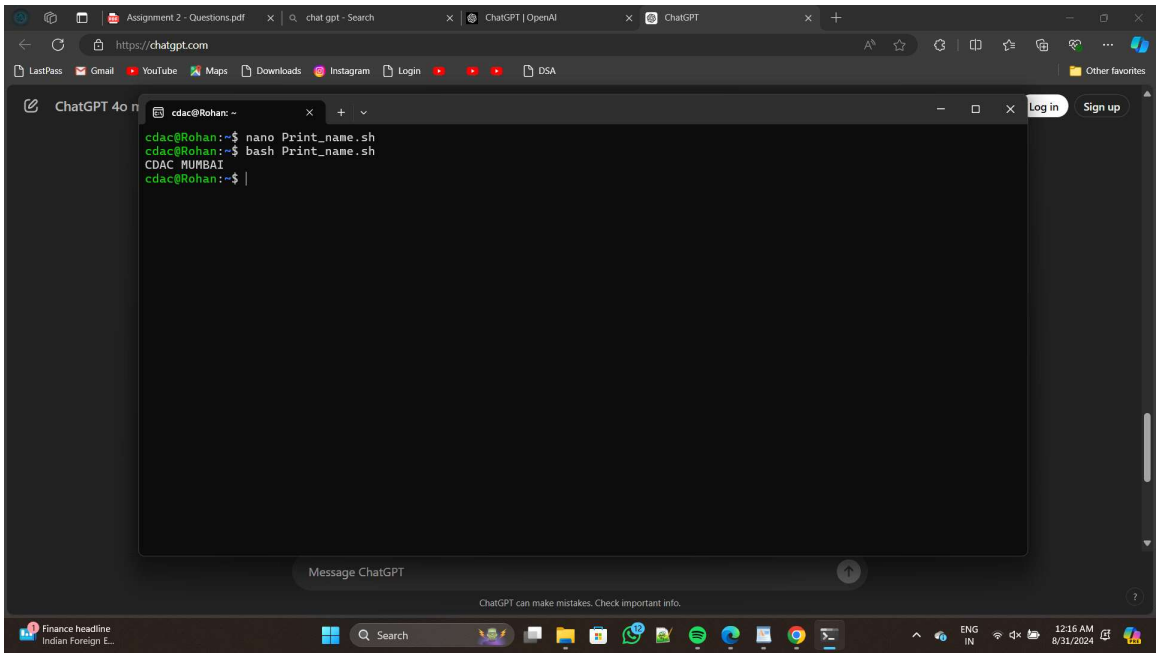
#! bin/bash

name="CDAC MUMBAI"

echo "$name"

bash Print_name.sh





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

-->>

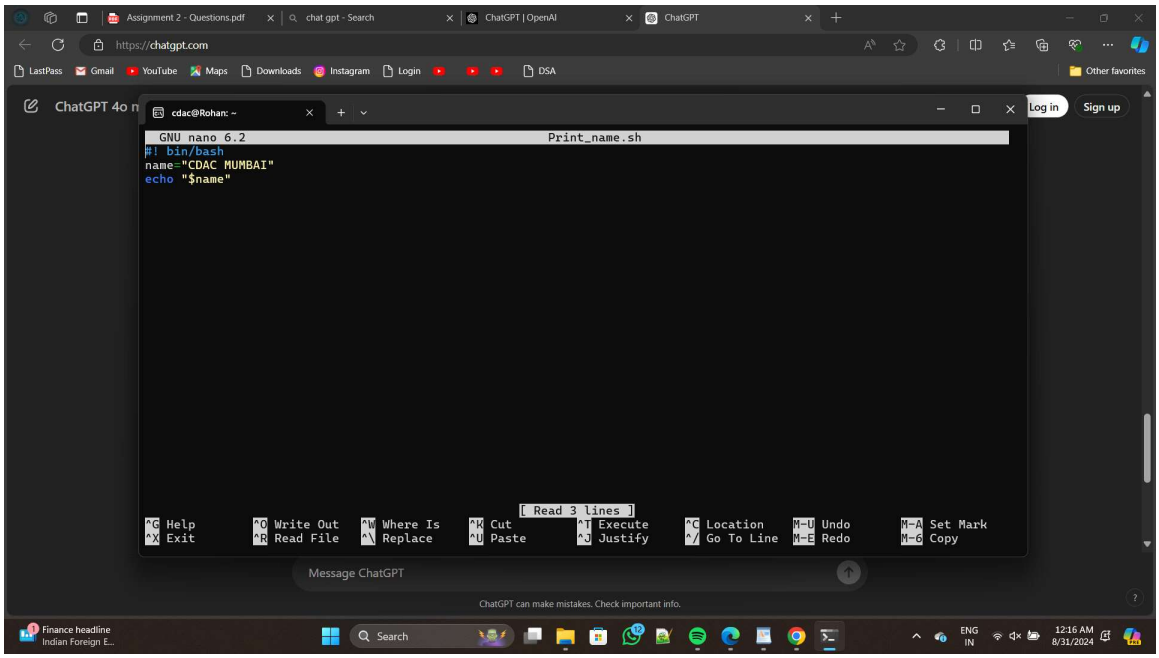
nano print_number.sh

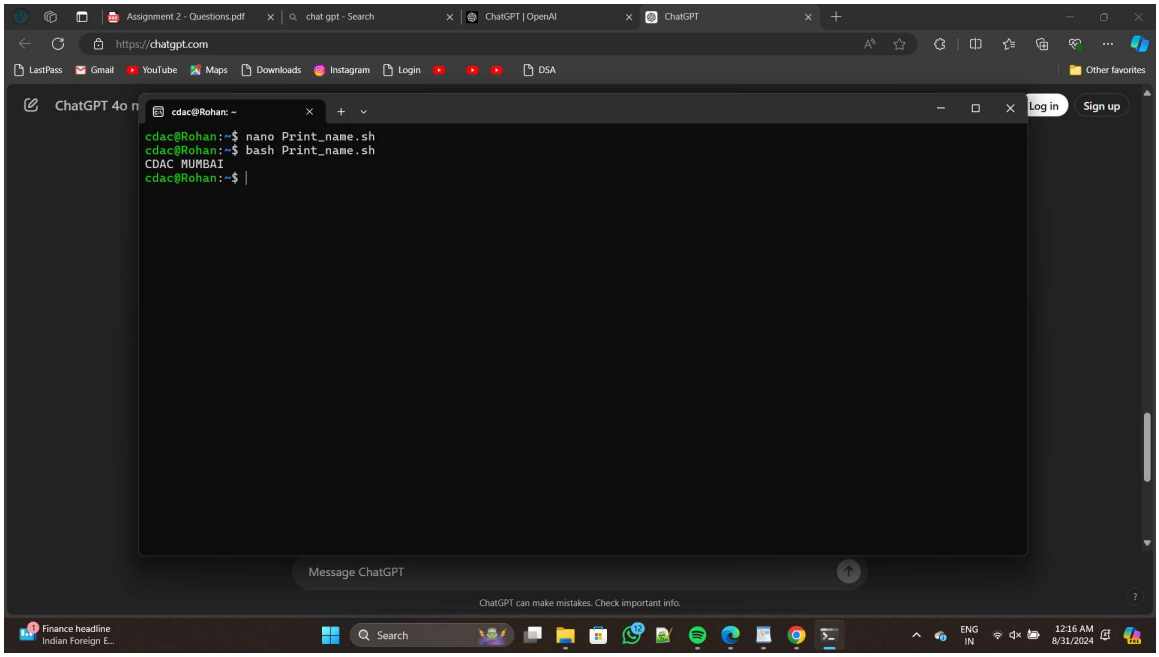
#! bin/bash

echo "Enter you number :"

read number

echo "You entered: $number"

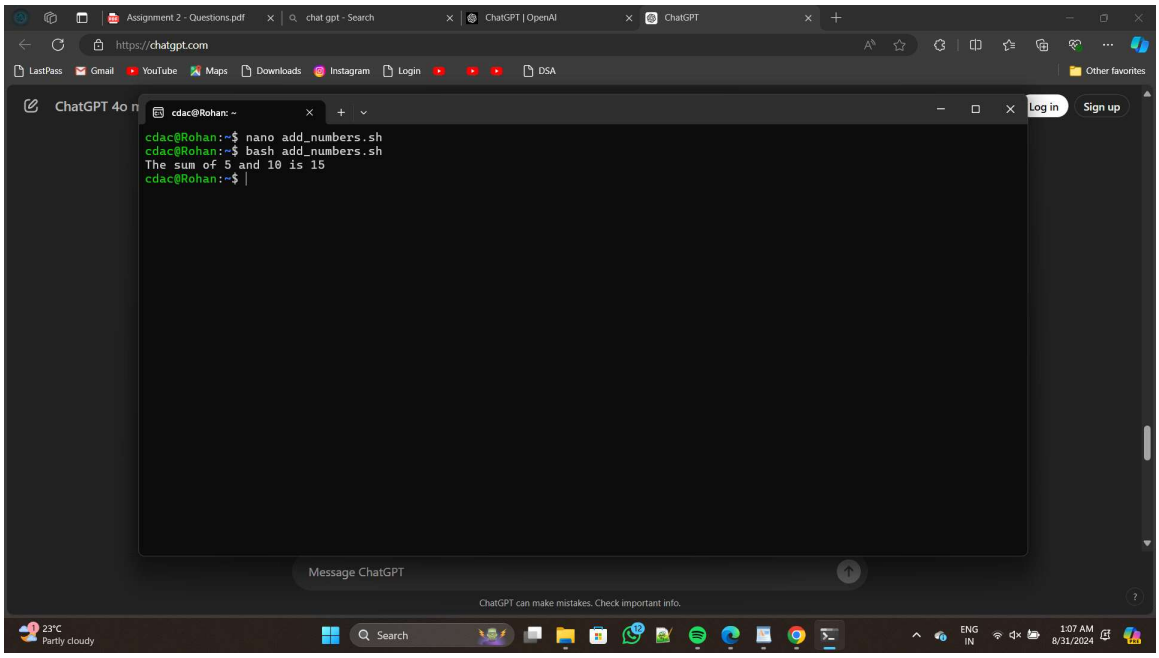




Question 4: Write a shell script that performs addition of two numbers (e.g., 5 and 3) and prints the result.

-->>

```
nano add_numbers.sh

#! bin/bash

num1=5

num2=10

sum=$((num1+num2))

echo "The sum of $num1 and $num2 is $sum"
```



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

-->> nano p5

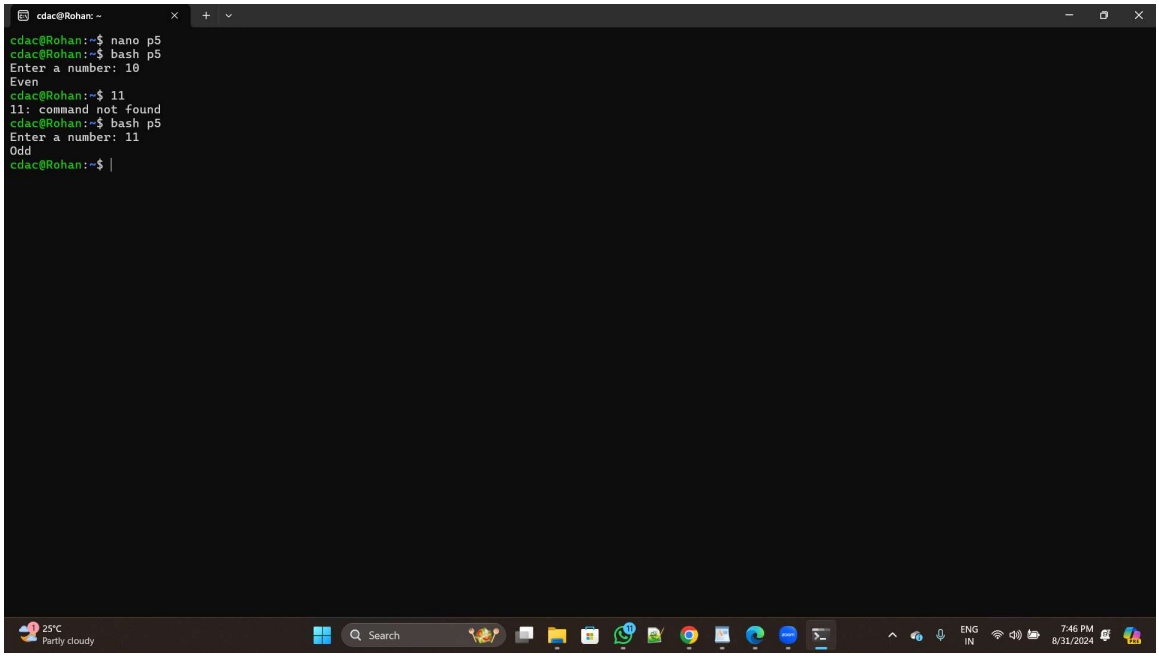
#!/bin/bash

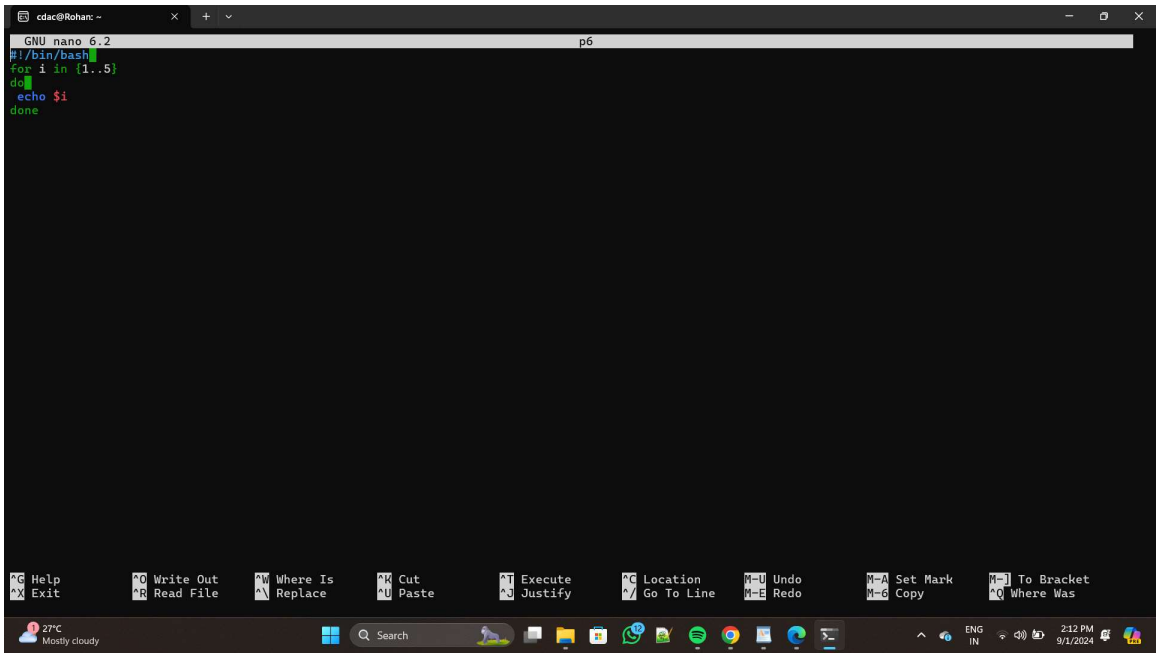
read -p "Enter a number: " number

```
if [ $((number % 2)) -eq 0 ]; then
    echo "Even"
else
    echo "Odd"
fi
```

bash p5

then we get output as per our input.





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

-->> nano p6

#!/bin/bash

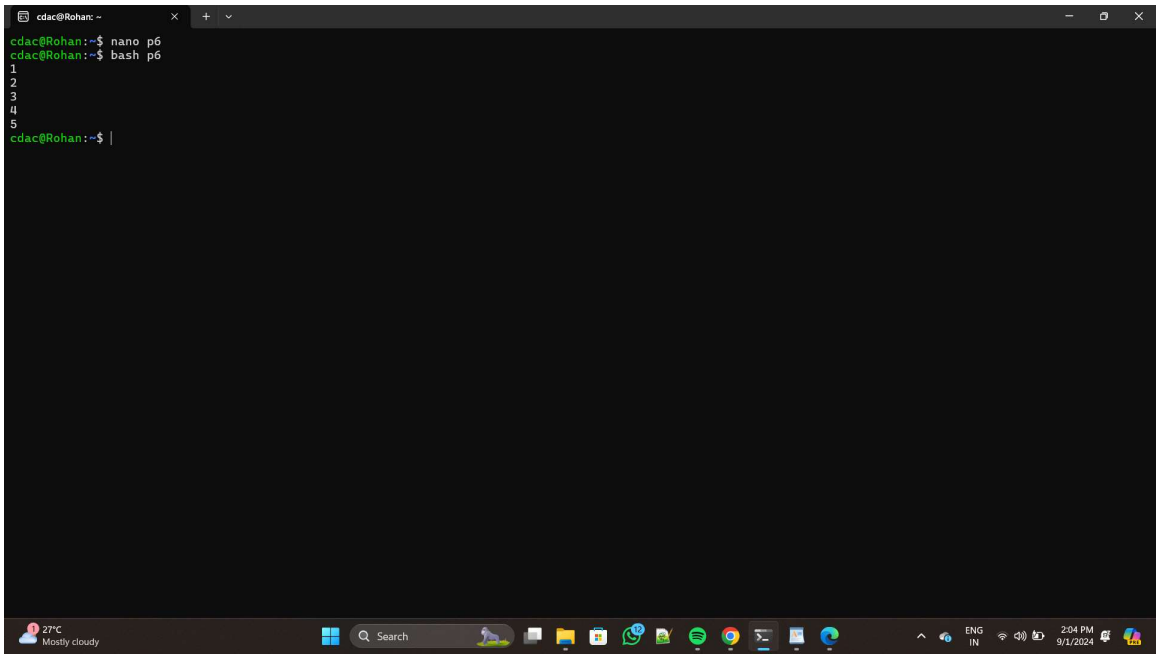
for i in {1..5}

do

echo $i

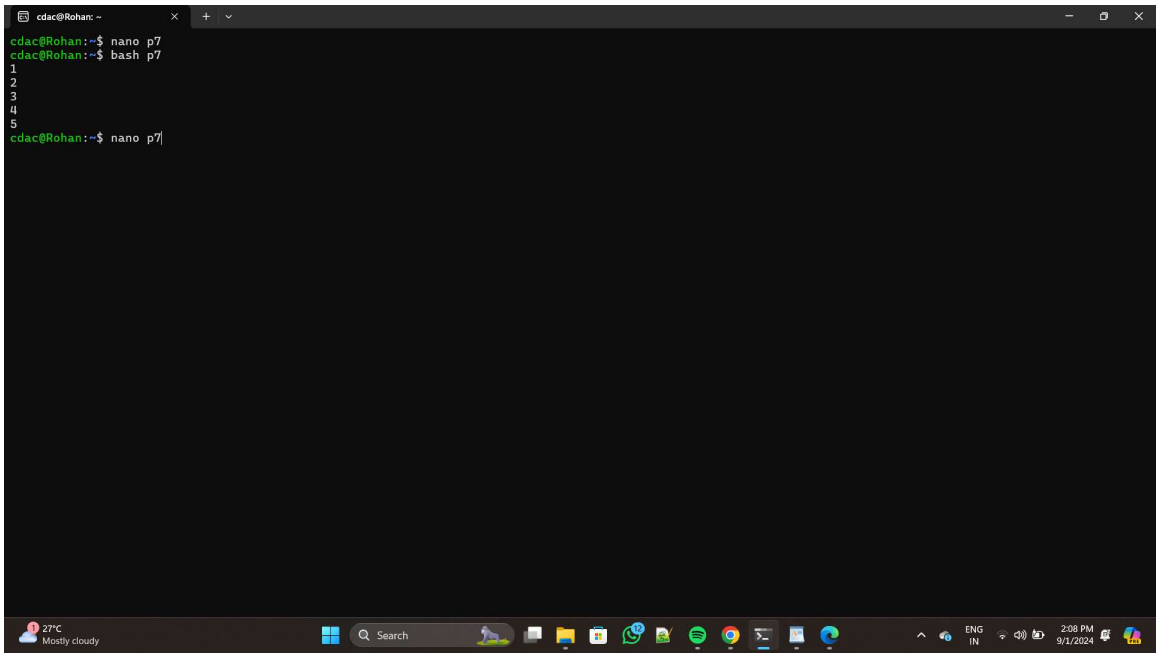
done

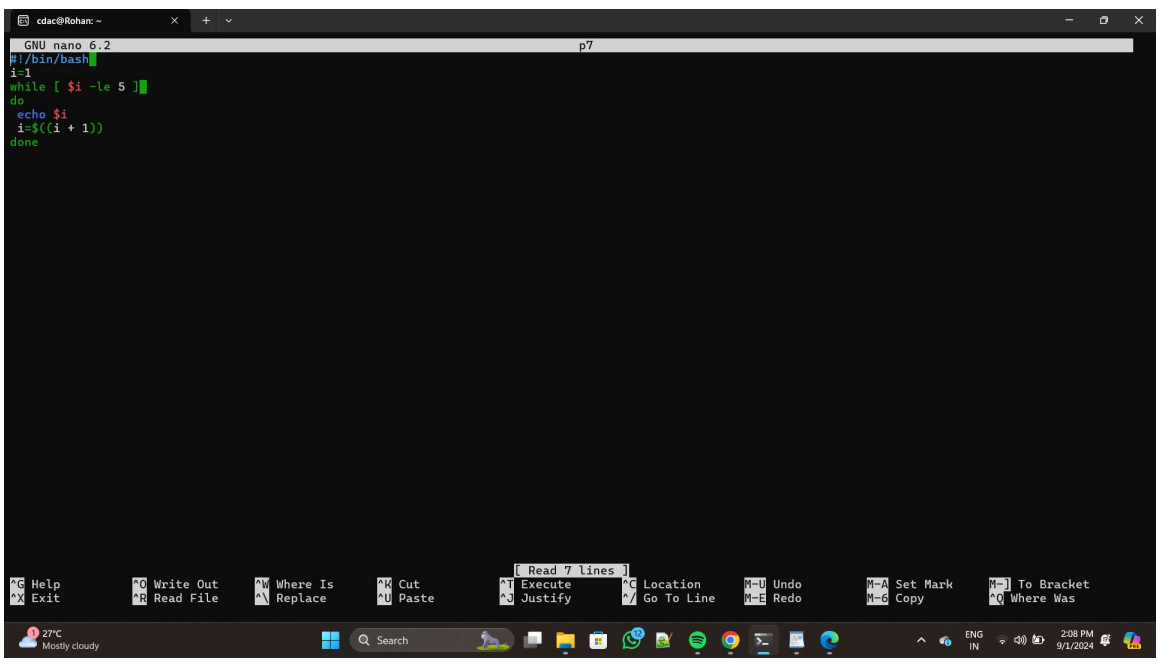
bash p6



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

```
-->> nano p7

#!/bin/bash

i=1

while [ $i -le 5]

do

echo $i

i=$(( i + 1))

bash p7
```

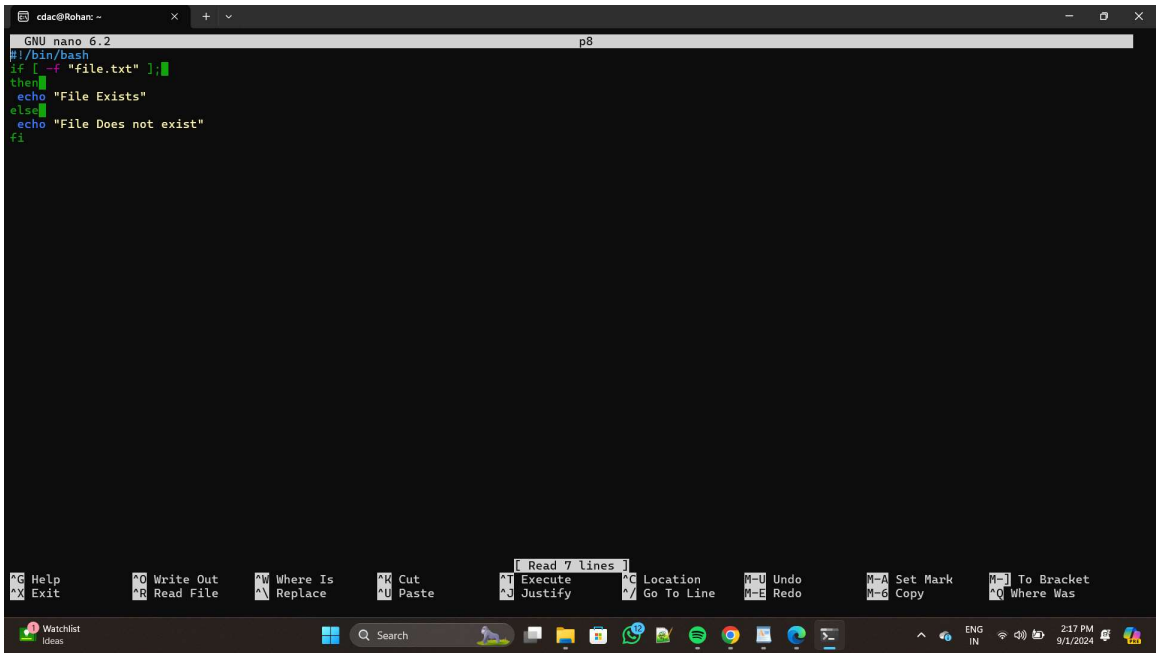


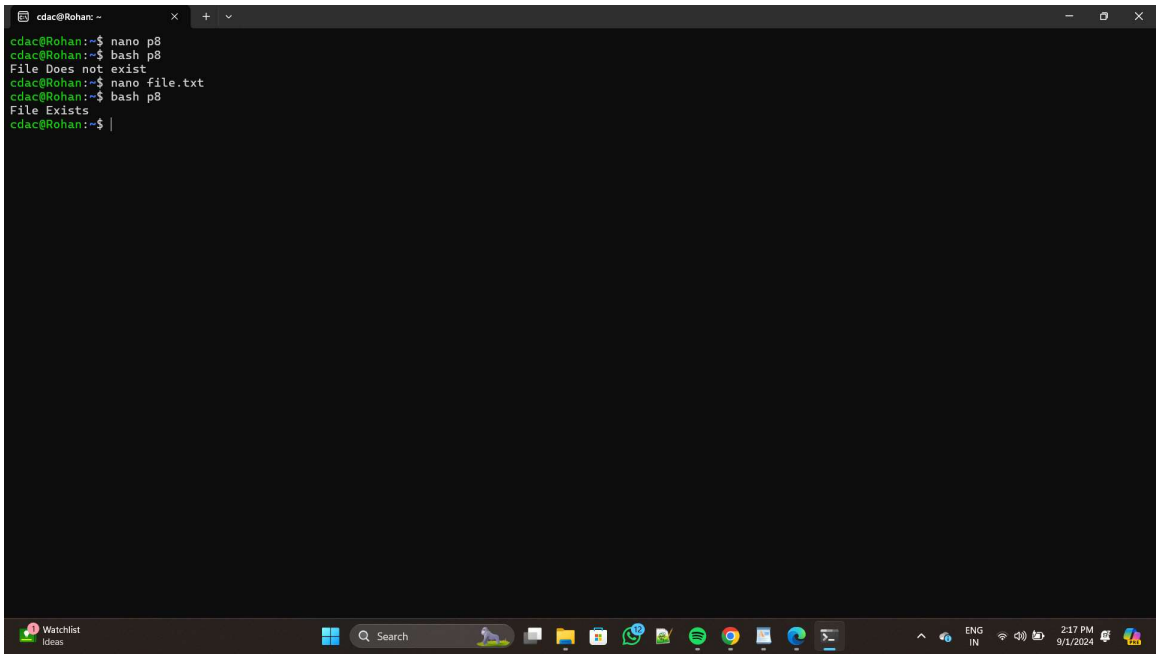


Question 8: Write a shell script that checks if a file named "file.txt"

exists in the current directory. If it does, print "File exists", otherwise, print "File does not exist".

```
-->> nano p8

#!/bin/bash

if [ -f "file.txt" ]; then

echo "File exists"

else

echo "File does not exists"

fi

bash p8
```


cdac@Rohan: ~
GNU nano 6.2 p8
#!/bin/bash
if [-f "file.txt"];
then
echo "File Exists"
else
echo "File Does not exist"
fi
[Read 7 lines]
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^Q Where Was


cdac@Rohan: ~
cdac@Rohan:~$ nano p8
cdac@Rohan:~$ bash p8
File Does not exist
cdac@Rohan:~$ nano file.txt
cdac@Rohan:~$ bash p8
File Exists
cdac@Rohan:~$

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.

-->> nano p9

```
#!/bin/bash

read -p "Enter a number: " number

if [ $number -gt 10 ]; then

echo "The number entered is greater than 10"

else

echo "The number entered is less than 10"
```

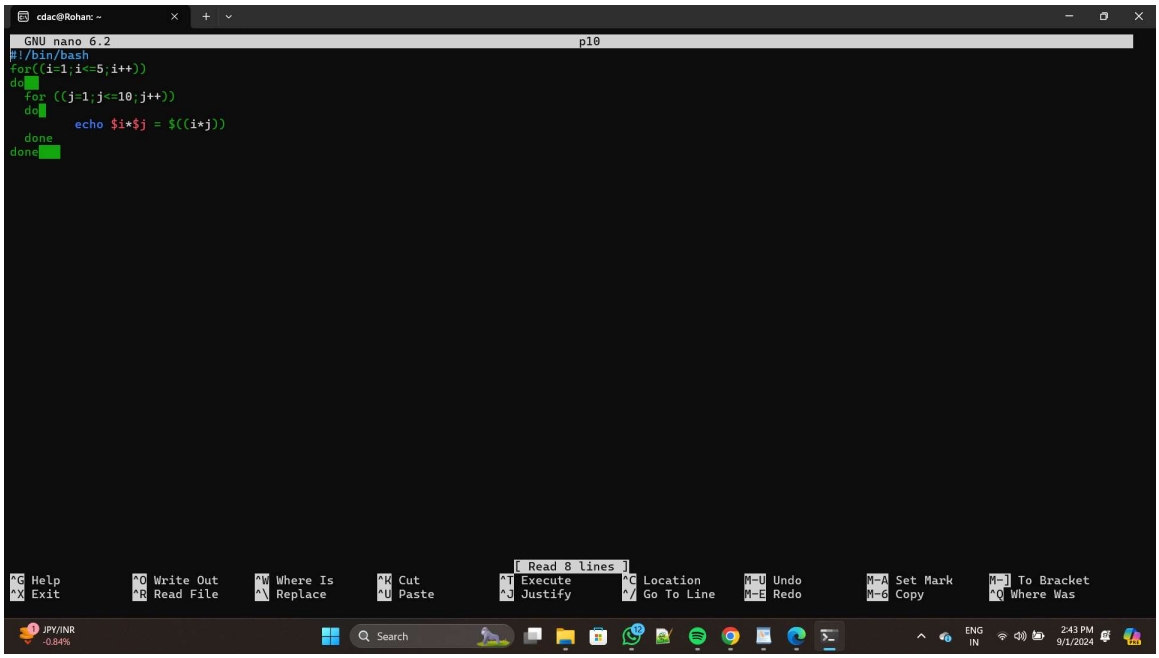
```
cdac@Rohan: ~
  GNU nano 6.2                                                    p9
#!/bin/bash
read -p "Enter a number: " number
if [ $number -gt 10 ]; then
 echo "The number entered is greater than 10"
else
 echo "The number entered is less than 10"
fi

                                                [ Read 7 lines ]
^G Help      ^O Write Out   ^W Where Is    ^K Cut       ^T Execute     ^C Location    M-U Undo       M-A Set Mark   M-] To Bracket
^X Exit      ^R Read File   ^\ Replace     ^U Paste     ^J Justify     ^/ Go To Line  M-E Redo       M-6 Copy       ^Q Where Was
```

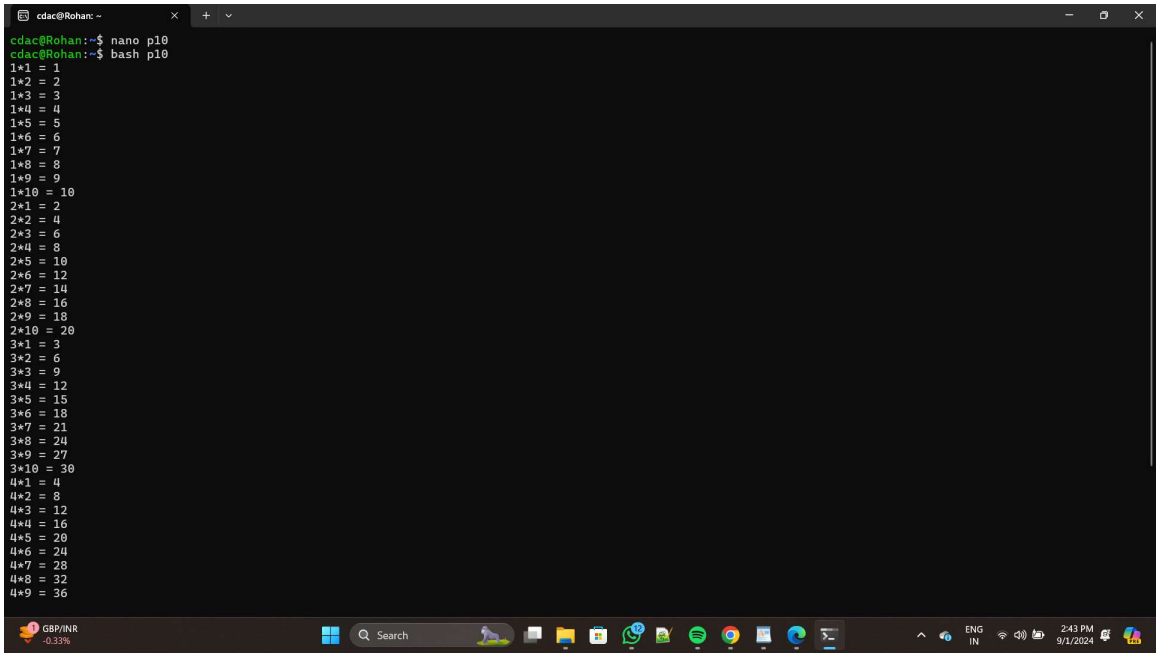
```
cdac@Rohan: ~
cdac@Rohan:~$ nano p9
cdac@Rohan:~$ bash p9
Enter a number: 11
The number entered is greater than 10
cdac@Rohan:~$ 9
9: command not found
cdac@Rohan:~$ bash p9
Enter a number: 9
The number entered is less than 10
cdac@Rohan:~$
```

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.

```
-->> nano p10

#!/bin/bash

for((i=1;i<=5;i=++))

do

  for((j=1;j<=10;j++))

  do

      echo $i*$j = $((i*j))

  done

done
```

bash p10

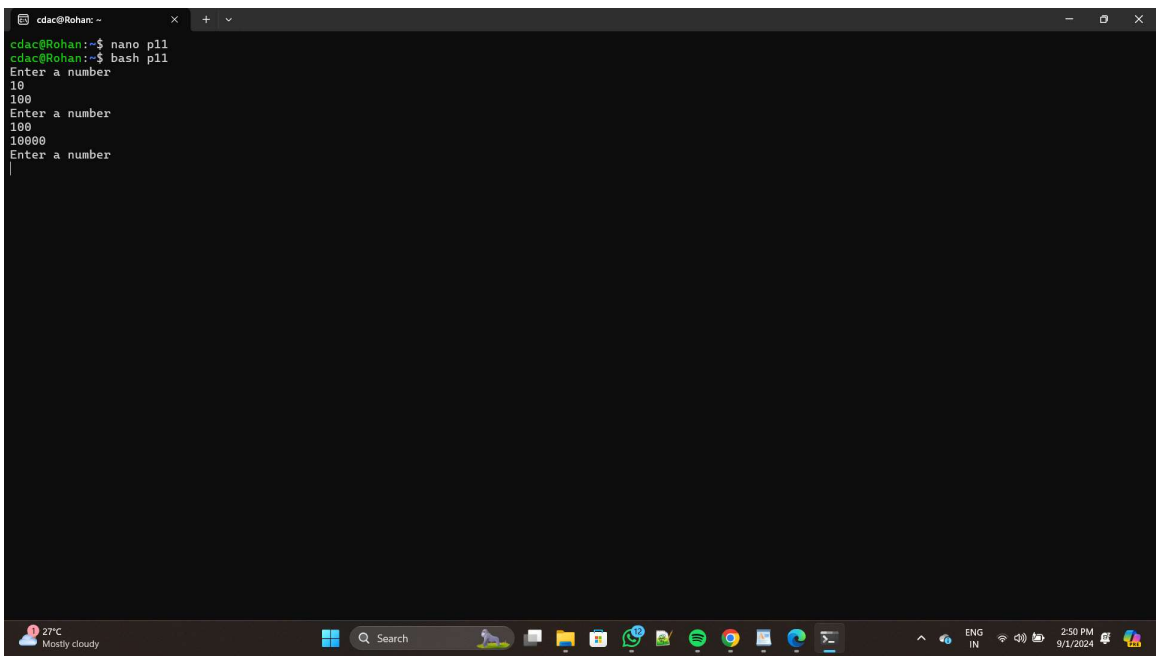

cdac@Rohan: ~
GNU nano 6.2 p10
#!/bin/bash
for((i=1;i<=5;i++))
do
for ((j=1;j<=10;j++))
do
echo $i*$j = $((i*j))
done
done
[Read 8 lines]
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^Q Where Was

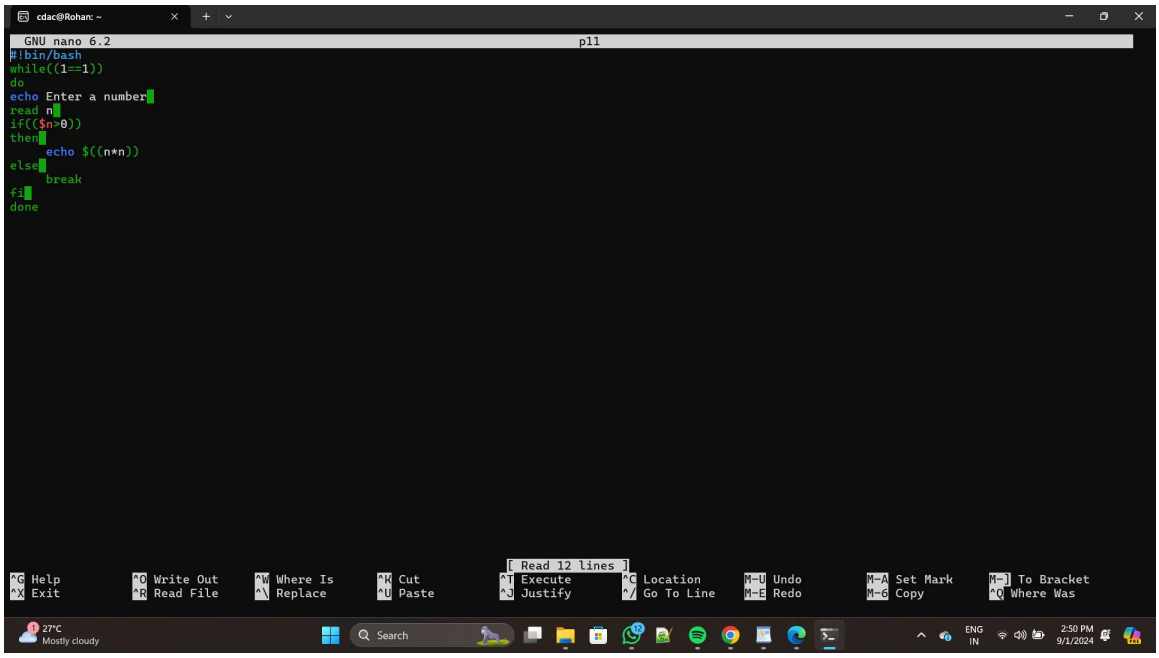

cdac@Rohan: ~
cdac@Rohan:~$ nano p10
cdac@Rohan:~$ bash p10
1*1 = 1
1*2 = 2
1*3 = 3
1*4 = 4
1*5 = 5
1*6 = 6
1*7 = 7
1*8 = 8
1*9 = 9
1*10 = 10
2*1 = 2
2*2 = 4
2*3 = 6
2*4 = 8
2*5 = 10
2*6 = 12
2*7 = 14
2*8 = 16
2*9 = 18
2*10 = 20
3*1 = 3
3*2 = 6
3*3 = 9
3*4 = 12
3*5 = 15
3*6 = 18
3*7 = 21
3*8 = 24
3*9 = 27
3*10 = 30
4*1 = 4
4*2 = 8
4*3 = 12
4*4 = 16
4*5 = 20
4*6 = 24
4*7 = 28
4*8 = 32
4*9 = 36

Question 11: Write a shell script that uses a while loop to read numbers from the user until the user enters a negative number. For each positive number entered, print its square. Use the break statement to exit the loop when a negative number is entered.

```
-->> nano p11

#!/bin/bash

while((1==1))

do

echo Enter a number

read n

if(($n>=0))

then
```

```
    echo $((n*n))
else
    break
fi
done
```




cdac@Rohan: ~
GNU nano 6.2
p11
#!bin/bash
while((1==1))
do
echo Enter a number
read n
if(($n>0))
then
echo $((n*n))
else
break
fi
done
[Read 12 lines]
^G Help
^X Exit
^O Write Out
^R Read File
^W Where Is
^\ Replace
^K Cut
^U Paste
^T Execute
^J Justify
^C Location
^/ Go To Line
M-U Undo
M-E Redo
M-A Set Mark
M-6 Copy
M-] To Bracket
^Q Where Was
27°C
Mostly cloudy
Search
ENG
IN
2:50 PM
9/1/2024