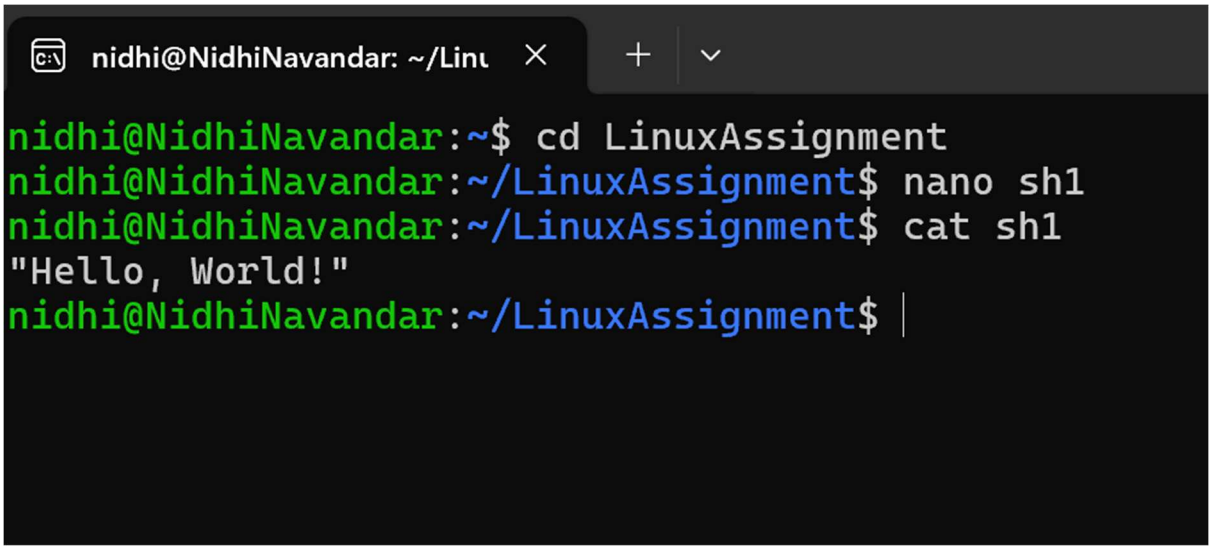
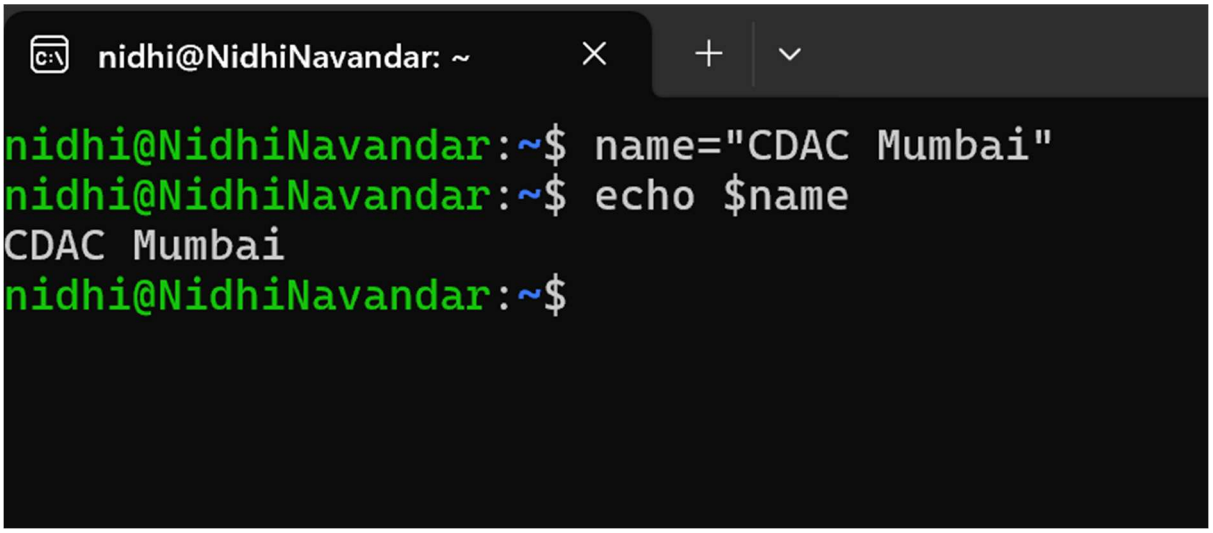
ASSIGNMENT - 02

PART C

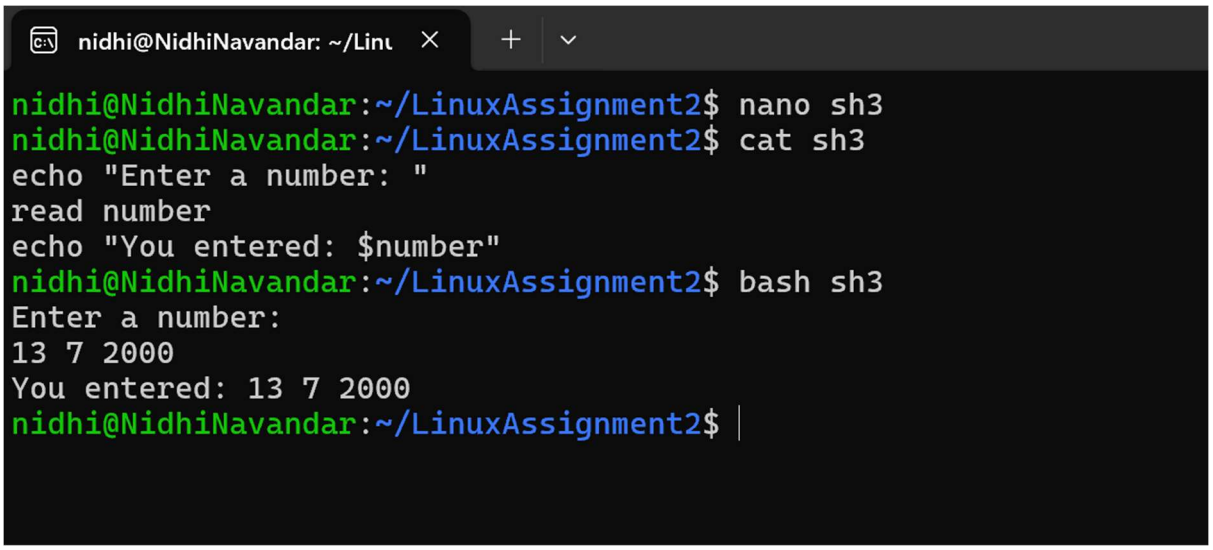
Question 1: Write a shell script that prints "Hello, World!" to the terminal.



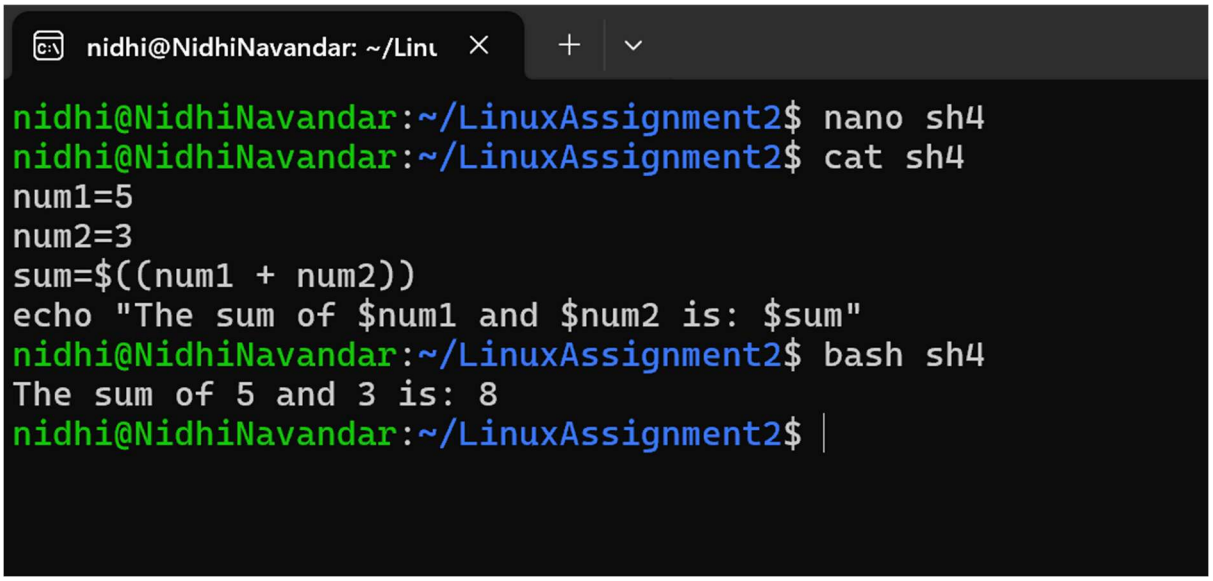
Question 2: Declare a variable named "name" and assign the value "CDAC Mumbai" to it. Print the value of the variable.



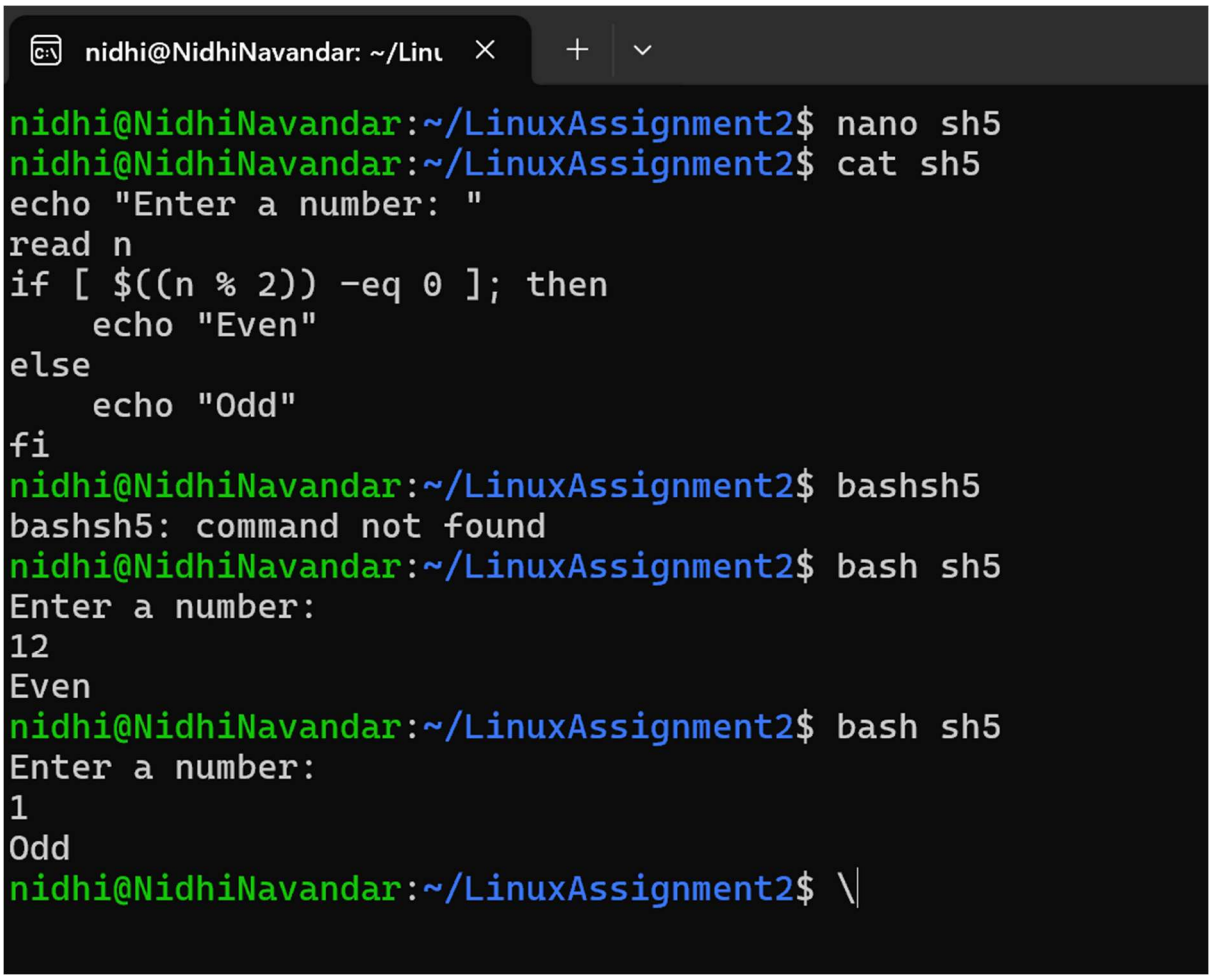
Question 3: Write a shell script that takes a number as input from the user and prints it.



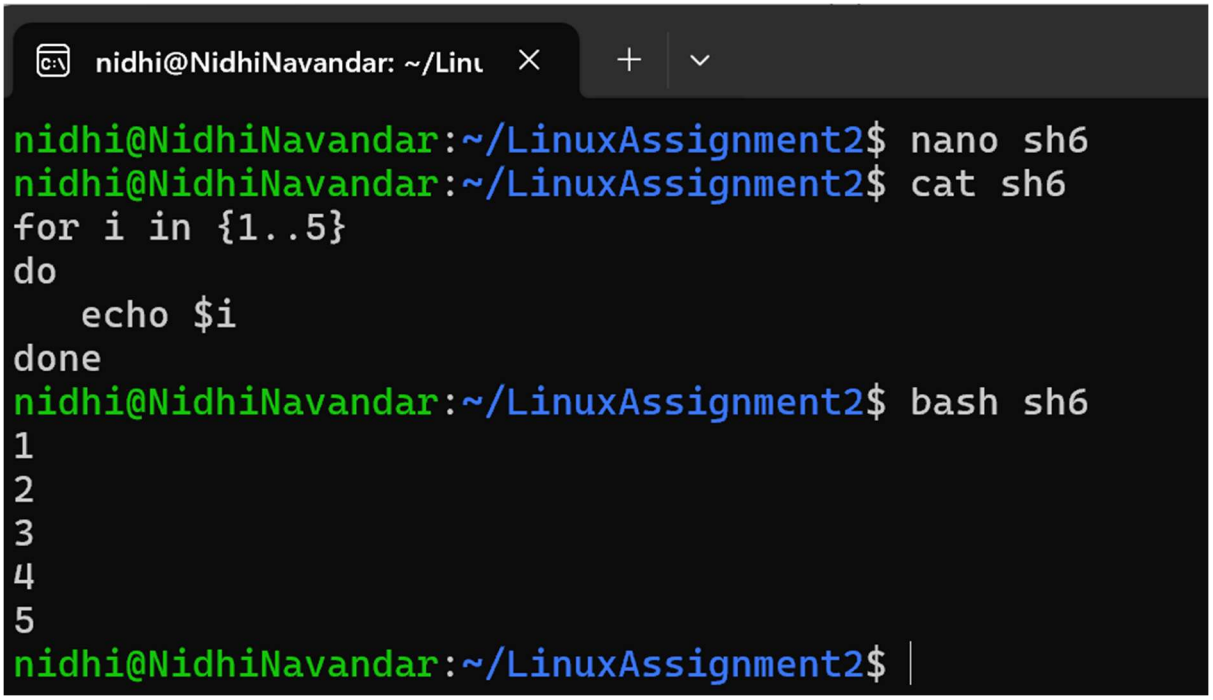
Question 4: Write a shell script that performs addition of two numbers (e.g., 5 and 3) and prints the result.



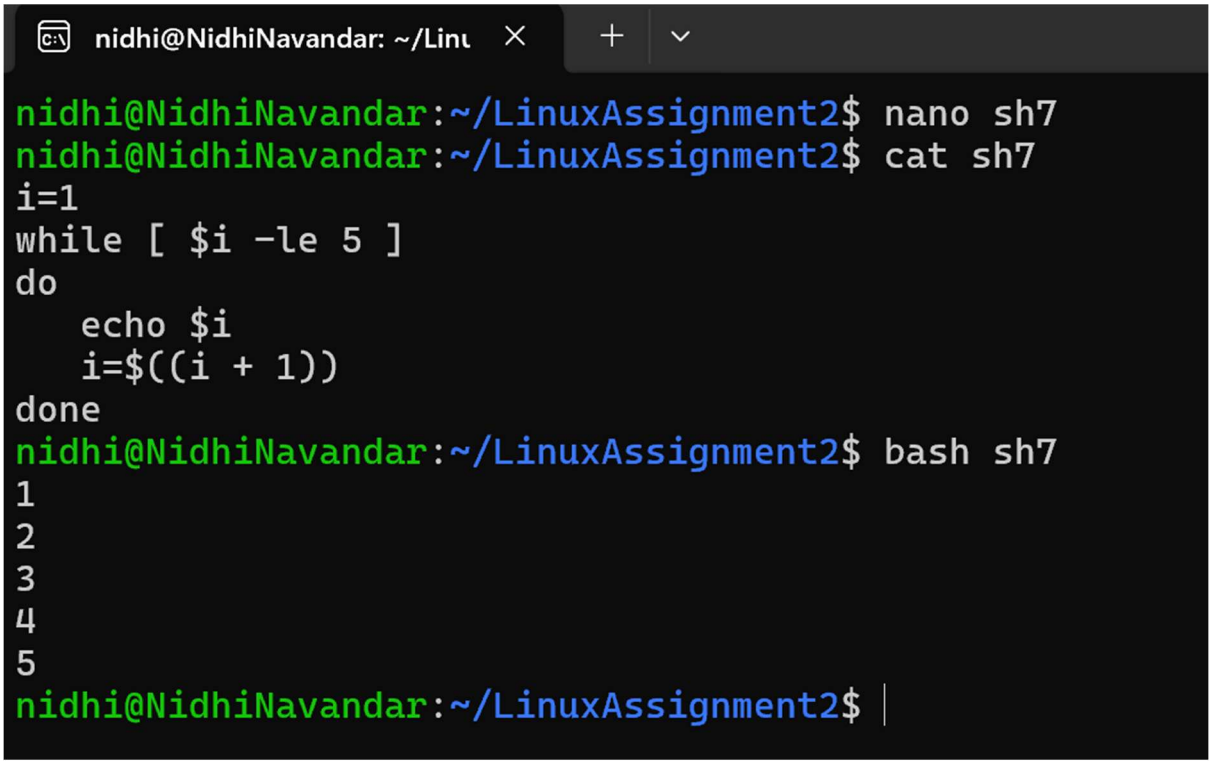
Question 5: Write a shell script that takes a number as input and prints "Even" if it is even, otherwise prints "Odd".



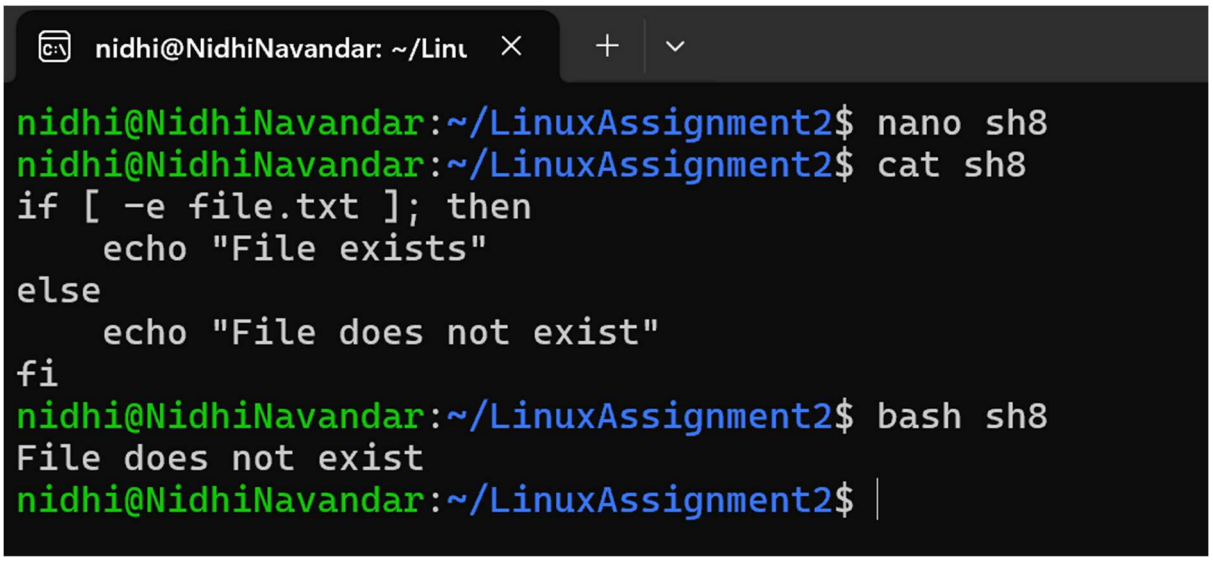
Question 6: Write a shell script that uses a for loop to print numbers from 1 to 5.



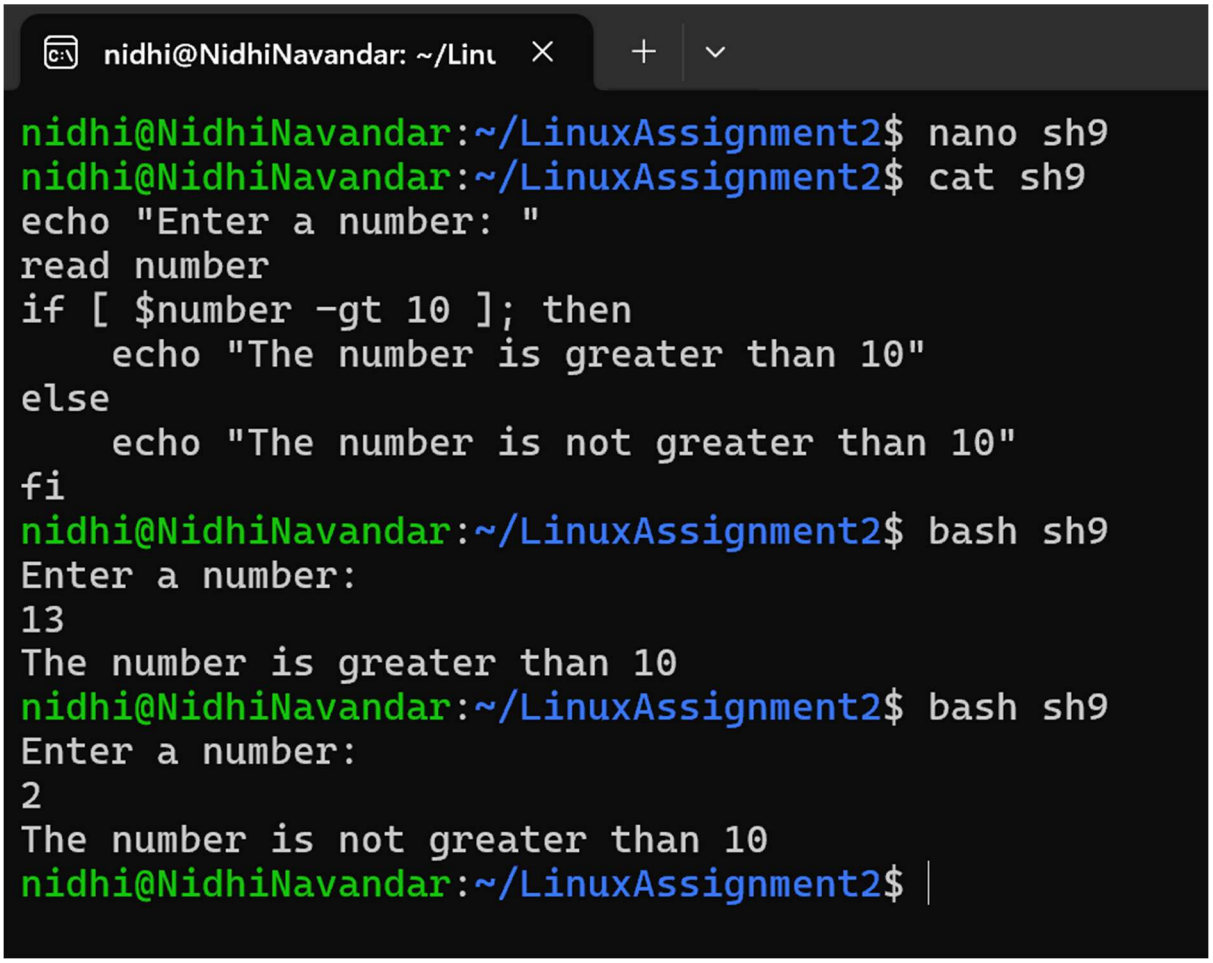
Question 7: Write a shell script that uses a while loop to print numbers from 1 to 5.



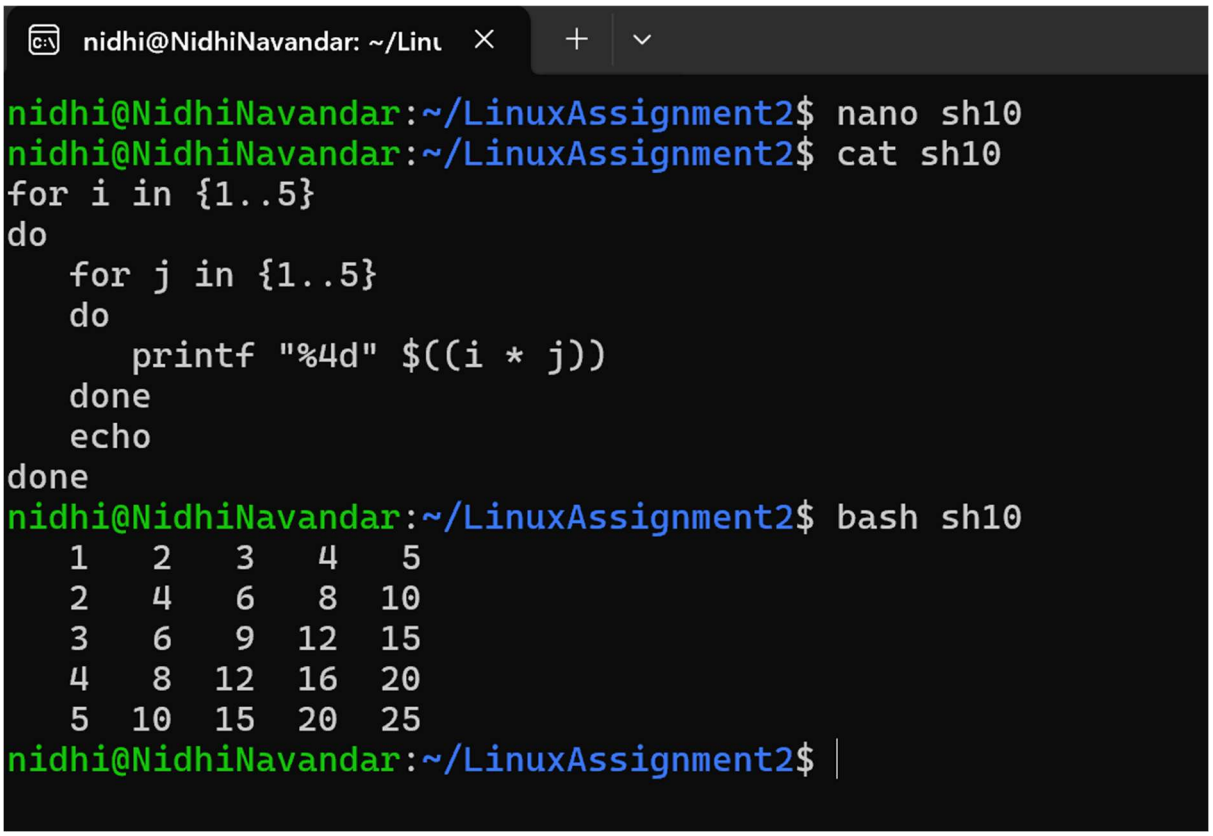
Question 8: Write a shell script that checks if a file named "file.txt" exists in the current directory. If it does, print "File exists", otherwise, print "File does not exist".



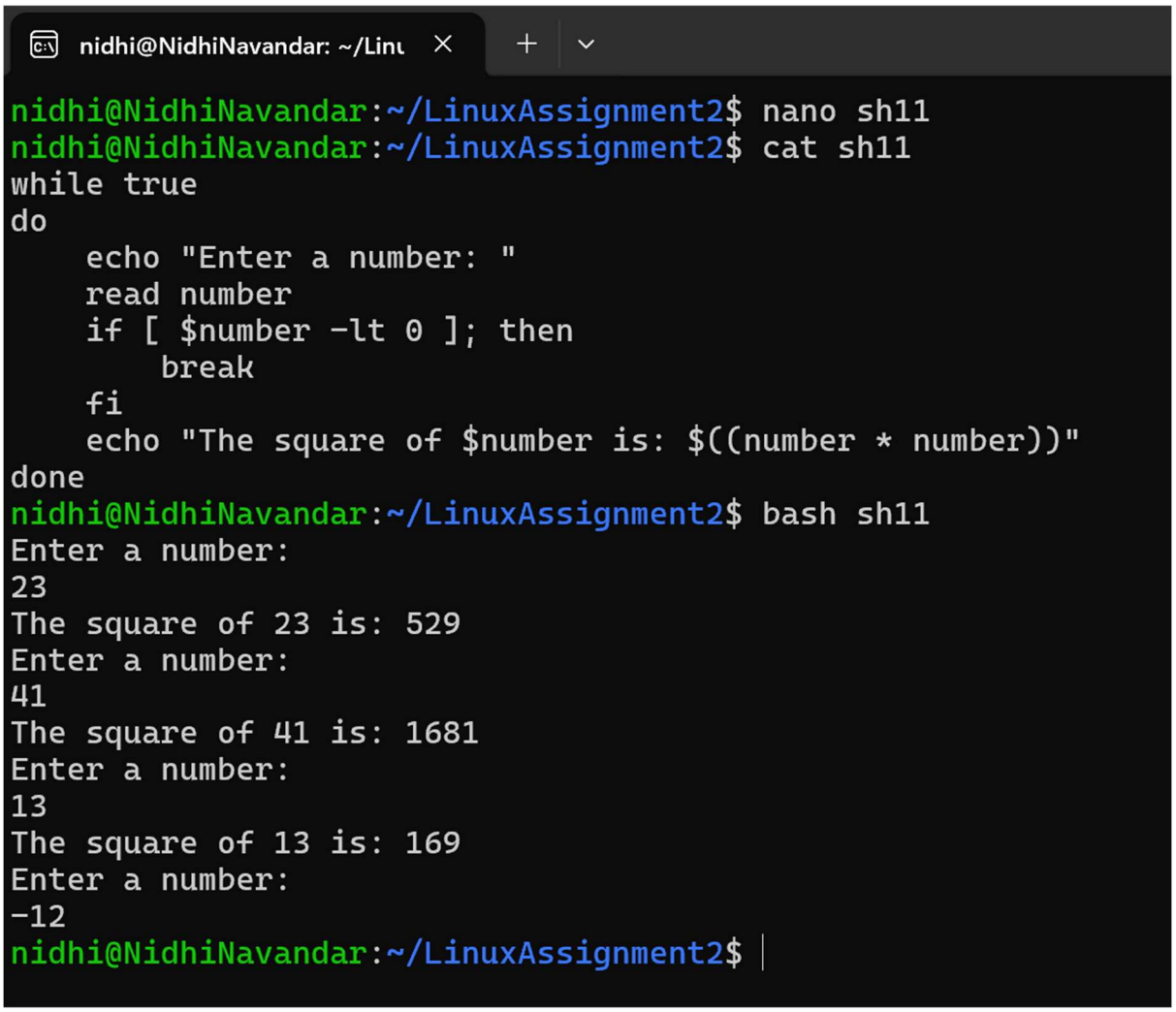
Question 9: Write a shell script that uses the if statement to check if a number is greater than 10 and prints a message accordingly.



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.



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.



PART A - What will the following commands do?

1. **echo "Hello, World!"**

   Prints "Hello, World!" to the terminal.

2. **name="Productive"**

   Assigns the string "Productive" to the variable name.

3. **touch file.txt**

   Creates an empty file named file.txt if it does not exist. If it already exists, updates its timestamp.

4. **ls -a**

   Lists all files and directories, including hidden files (those starting with .).

5. **rm file.txt**

   Deletes the file file.txt.

6. **cp file1.txt file2.txt**

   Copies file1.txt to file2.txt. If file2.txt exists, it will be overwritten.

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

   Moves file.txt to the specified directory (/path/to/directory/).

8. **chmod 755 script.sh**

   Changes the permissions of script.sh to 755 (owner can read, write, execute; group and others can read and execute).

9. **grep "pattern" file.txt**

   Searches for the string "pattern" in file.txt and displays matching lines.

10. **kill PID**

    Terminates the process with the given PID (Process ID).

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

    Creates a directory mydir.

    Changes into mydir.

    Creates an empty file file.txt.

    Writes "Hello, World!" into file.txt.

Displays the content of file.txt.

12. **ls -l | grep ".txt"**

    Lists files in long format and filters out only those containing .txt in their names.

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

    Concatenates file1.txt and file2.txt, sorts the lines, and removes duplicate lines.

14. **ls -l | grep "^d"**

    Lists only directories (^d indicates lines starting with "d", which denotes directories in ls -l).

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

    Recursively searches for "pattern" inside all files within /path/to/directory/.

16. **cat file1.txt file2.txt | sort | uniq -d**

    Concatenates file1.txt and file2.txt, sorts the lines, and displays only duplicate lines.

17. **chmod 644 file.txt**

    Sets file permissions to 644 (owner can read and write; group and others can only read).

18. **cp -r source_directory destination_directory**

    Copies source_directory and all its contents (recursively) to destination_directory.

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

    Searches for files with a .txt extension in /path/to/search and its subdirectories.

20. **chmod u+x file.txt**

    Grants execute (+x) permission to the user (u) for file.txt.

21. **echo $PATH**

    Displays the system's PATH environment variable, which contains directories where executable files are searched for.

PART B

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 used for changing the directory

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

Identify the Incorrect Commands:

1. chmodx is used to change file permissions.

chmod is used to change the file permissions.

2. cpy is used to copy files and directories.

cp command is used to copy the files.

3. mkfile is used to create a new file.

touch command is used to create files.

4. catx is used to concatenate files.

cat command is used to concatenate the files.

5. rn is used to rename files.

mv command is used to rename the files.

PART – E

1. Consider the following processes with arrival times and burst times:

Process	**Arrival Time**	**Burst Time**
P1	**0**	**5**
P2	**1**	**3**
P3	**2**	**6**

Calculate the average waiting time using First-Come, First-Served (FCFS) scheduling.

As it is a First Come, First Served :-

Process	Arrival Time	Burst Time	Waiting Time (**Start Time – Arrival Time**)
P1	0	5	0
P2	1	3	4
P3	2	6	6

Gantt chart

0 5 8 14

P1	P2	P3

AVG Waiting Time = (0+4+6)/3 = 3.33

2. Consider the following processes with arrival times and burst times:

Process	**Arrival Time**	**Burst Time**
P1	**0**	**3**
P2	**1**	**5**
P3	**2**	**1**
P4	**3**	**4**

Calculate the average turnaround time using Shortest Job First (SJF) scheduling.

Process	Arrival Time	Burst Time	Waiting Time	TurnAround Time (**Burst Time + Waiting Time**)
P1	0	3	0	3
P2	1	5	7	12
P3	2	1	1	2
P4	3	4	1	5

Gantt chart

0 3 4 8 13

P1	P3	P4	P2

AVG Turn Around Time :- (3+12+2+5)/ 4 = 22/4 = 5.5

3. Consider the following processes with arrival times, burst times, and priorities (lower number

indicates higher priority):

Process	**Arrival Time**	**Burst Time**	**Priority**
P1	**0**	**6**	**3**
P2	**1**	**4**	**1**
P3	**2**	**7**	**4**
P4	**3**	**2**	**2**

Calculate the average waiting time using Priority Scheduling.

Non Preemptive

Process	Arrival Time	Burst Time	Priority	Waiting Time (**Start Time – Arrival Time**)
P1	0	6	3	0
P2	1	4	1	5
P3	2	7	4	10
P4	3	2	2	7

Gantt chart

0 6 10 12 19

P1	P2	P4	P3

AVG Waiting Time = (0+5+10+7)/4 = 5.5

4. Consider the following processes with arrival times and burst times, and the time quantum for

Round Robin scheduling is 2 units:

Process	**Arrival Time**	**Burst Time**
P1	**0**	**4**
P2	**1**	**5**
P3	**2**	**2**
P4	**3**	**3**

Calculate the average turnaround time using Round Robin scheduling.

Process	Arrival Time	Burst Time	Waiting Time	Turn Around Time
P1	0	4	6	10
P2	1	5	8	13
P3	2	2	2	4
P4	3	3	7	10

Gantt Chart

0 2 4 6 8 10 12 13 14

P1	P2	P3	P4	P1	P2	P4	P2

AVG Turn Around Time :- (10+13+4+10)/ 4 = 37/4 = 9.25

5. Consider a program that uses the fork() system call to create a child process. Initially, the parent

process has a variable x with a value of 5. After forking, both the parent and child processes

increment the value of x by 1.

What will be the final values of x in the parent and child processes after the fork() call?

In a program using the fork() system call, the parent process has a variable x with a value of 5. After forking, both the parent and child processes increment the value of x by 1.

After the fork() call, both the parent and child processes have their own copies of the variable x. Incrementing x by 1 each Process result in:

Parent Process :- x becomes 6

Child Process :- x becomes 6

Therefore, the final value of x is 6 in both the parent and child processes.