

CDAC MUMBAI

Concepts of Operating System

Assignment 2

Part A

What will the following commands do?

1. **echo "Hello, World!"** : print the Hello, World!
2. **name="Productive"** : assign the value "Productive" to name and we can access it by echo \$name
3. **touch file.txt** : create an empty file name file.txt or updates the timestamp of the file if already exists.
4. **ls -a** : lists all files and directories in the current directory including hidden one
5. **rm file.txt** : remove/ deletes the file name file.txt
6. **cp file1.txt file2.txt** : copy the content of file1.txt to file2.txt
7. **mv file.txt /path/to/directory/** : Move the file name file.txt to respective path.
8. **chmod 755 script.sh** : Changes the permissions of script.sh to rwxr-xr-x
9. **grep "pattern" file.txt** : searches for the specified 'pattern' in 'file.txt' and prints lines that contain it.
10. **kill PID** : Sends a termination signal to the process with specified process ID
11. **mkdir mydir && cd mydir && touch file.txt && echo "Hello, World!" > file.txt && cat file.txt**
:
 - a. create directory named mydir changes into that directory, creates an empty file named file.txt write Hello World to file.txt and then displays the contents of file.txt.
12. **ls -l | grep ".txt"** : list files in long format and filters the output to show only lines containing .txt which is typically list files with .txt extension
13. **cat file1.txt file2.txt | sort | uniq** : concatenates the contents of file1.txt and file2.txt sort the combined output and remove duplicate lines.
14. **ls -l | grep "^d"** : Lists files in long format and filters the output to show only directories
15. **grep -r "pattern" /path/to/directory/** : searches for specified pattern in all files within the specified directory.
16. **cat file1.txt file2.txt | sort | uniq -d** : concatenates the contents of file1.txt and file2.txt sort the combined output and shows only duplicate lines.
17. **chmod 644 file.txt** : changes the permissions of file.txt to rw-r--r-- giving the owner read and write permissions and others read only permissions
18. **cp -r source_directory destination_directory** : copy content from one file to other.
19. **find /path/to/search -name "*.txt"** : searches for files with the .txt for given path
20. **chmod u+x file.txt** : add execute permissions for the owner of file.txt allowing owner to execute the file.
21. **echo \$PATH** : print the value of the path variable

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**
4. **pwd** stands for "print working directory" and displays the current directory.: **True**
5. **grep** is used to search for patterns in files.: **Ture**
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**

Part C

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

Answer: `echo "Hello, World!"`

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

Answer: `name="CDAC Mumbai"`
`echo "$name"`

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

Answer: `echo Enter Number`
`read num`
`echo "$num"`

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

Answer `echo Enter Number1`
`read num1`
`echo Enter Number2`
`read num2`
`num3=`expr $num1 + $num2``
`echo "$num3"`

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

Answer: `echo "Enter Number"`
`read number`
`if [$$(number \% 2)$ -eq 0];`
`then`
 `echo "Even"`
`else`
 `echo "Odd"`
`fi`

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

Answer: `for i in {1..5}`
`do`
 `echo "$i"`
`done`

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

Answer: `i=1`

```

while [ $i -le 5 ]
do
    echo $i
    i=`expr $i + 1`
done

```

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".

Answer:

```

if [ -f "file.txt" ];
then
    echo "File exists"
else
    echo "File does not exist"
fi

```

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.

Answer:

```

echo Enter the num
read num
if [ $num -gt 10 ]
then
    echo "Greater than 10"
else
    echo "Not Greater than 10"
fi

```

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.

Answer:

```

for i in {1..5}
do
    for j in {1..10}
    do
        echo ${i * j}
    done
done

```

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.

Answer:

```

while true;
do
    read -p "Enter a number (negative to stop): " number
    if [ $number -lt 0 ];
    then
        break
    else
        square=$((number * number))
        echo "The square of $number is $square"
    fi
done

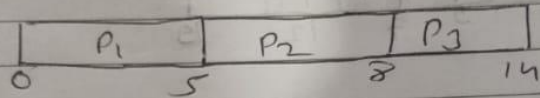
```

Part E

Assignment 2

①

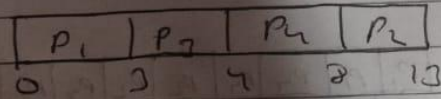
process	AT	BT	CT	WT	TAT
P ₁	0	5	5	0	5
P ₂	1	3	8	4	7
P ₃	2	6	14	6	12



$$WT = \frac{0 + 4 + 6}{3} = 3.66$$

②

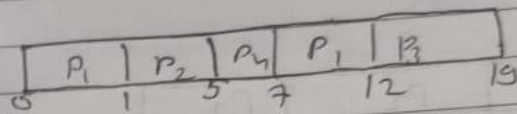
process	AT	BT	CT	TAT
P ₁	0	3	3	3
P ₂	1	5	13	12
P ₃	2	1	4	2
P ₄	3	4	8	5



$$TAT = \frac{3 + 12 + 2 + 5}{4} = 5.5$$

③

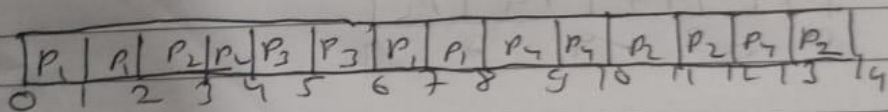
Process	AT	BT	Priority	CT	TAT	WT
P ₁	0	5	3	12	12	6
P ₂	1	4	1	5	4	0
P ₃	2	7	4	19	17	10
P ₄	3	2	2	7	4	2



$$WT = \frac{19}{4} = 4.75$$

④

Process	AT	BT	CT	TAT
P ₁	0	4	8	8
P ₂	1	5	14	13
P ₃	2	2	6	4
P ₄	3	3	13	10



$$AvgTAT = \frac{8+13+4+10}{4} = 8.75$$