CDAC MUMBAI
Concepts of Operating System
Assignment 2
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Part A
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What will the following commands do?
echo "Hello, World!"
> print
 name="Productive"
> assign value
 touch file.txt
> create file
ls -a
>list
rm file.txt
> remove file
cp file1.txt file2.txt
> copy file1.txt to file2.txt
 mv file.txt /path/to/directory/
> move
  chmod 755 script.sh
> give permission read & execute
 grep "pattern" file.txt
> find
 kill PID
>
 mkdir mydir && cd mydir && touch file.txt && echo "Hello, World!" > file.txt && cat file.txt
>
 ls -l | grep ".txt"
> find & list ".txt"
 cat file1.txt file2.txt | sort | uniq
>
 ls -l | grep "^d"
  grep -r "pattern" /path/to/directory/
>

cat file1.txt file2.txt | sort | uniq –d
>
chmod 644 file.txt
> give -rw-r - -r - - permission
cp -r source_directory destination_directory
>
find /path/to/search -name "*.txt"
>
chmod u+x file.txt
> give permission file.txt , user to execute
echo $PATH
> print the value PATH

Part B

Identify True or False:

1. ls is used to list files and directories in a directory.
> T
2. mv is used to move files and directories.
> T
3. cd is used to copy files and directories.
> F
4. pwd stands for "print working directory" and displays the current directory.
> T
5. grep is used to search for patterns in files.
> T
6. chmod 755 file.txt gives read, write, and execute permissions to the owner, and read and execute permissions to group and others.
> T
7. mkdir -p directory1/directory2 creates nested directories, creating directory2 inside directory1 if directory1 does not exist.
> T
8. rm -rf file.txt deletes a file forcefully without confirmation.
> T

Identify the Incorrect Commands:

1. chmodx is used to change file permissions.

> chmod +x filename to allow executable permissions.

2. cpy is used to copy files and directories.
>cp command to create a copy of the contents of the file or directory specified by the SourceFile or SourceDirectory parameters into the file or directory specified by the TargetFile or TargetDirectory parameters.

3. mkfile is used to create a new file.
>The mkfile command creates a file that is suitable for use as either an NFS-mounted or a local swap area.
4. catx is used to concatenate files.
>The CATX function combines strings and separates them with a delimiter. The CATX function also removes leading and trailing spaces when concatenating. You can specify any delimiter you want in the first argument of CATX function.

5. rn is used to rename files.
> "ren" command is used to rename files in computing

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Part C

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

```
cdac@LAPTOP-RLVRS19J:~$ nano PartC
cdac@LAPTOP-RLVRS19J:~$ bash PartC
Hello World!
cdac@LAPTOP-RLVRS19J:~$ cat PartC
# Question 1: Write a shell script that prints "Hello, World!"



echo "Hello World!"
cdac@LAPTOP-RLVRS19J:~$
```

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

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q2
cdac@LAPTOP-RLVRS19J:~/A2$ bash q2
CDAC Mumbai
cdac@LAPTOP-RLVRS19J:~/A2$ cat q2
#!/bin/bash

n="CDAC Mumbai"

echo $n
cdac@LAPTOP-RLVRS19J:~/A2$ nano q2
```

Error case:

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q2
cdac@LAPTOP-RLVRS19J:~/A2$ bash q2
q2: line 3: n: command not found

cdac@LAPTOP-RLVRS19J:~/A2$ cat q2
#!/bin/bash

n ="CDAC Mumbai"

echo $n
```

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

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q3
cdac@LAPTOP-RLVRS19J:~/A2$ bash q3
enter a number
5
number is 5
cdac@LAPTOP-RLVRS19J:~/A2$ cat q3
#!/bin/bash

echo "enter a number"
read n

echo number is $n
cdac@LAPTOP-RLVRS19J:~/A2$
```

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

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q4
cdac@LAPTOP-RLVRS19J:~/A2$ bash q4
n1
5
n2
3
addition= 8
cdac@LAPTOP-RLVRS19J:~/A2$ cat q4


echo n1
read n1
echo n2
read n2

add=`expr $n1 + $n2`
echo addition= $add
cdac@LAPTOP-RLVRS19J:~/A2$
```

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

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q5
cdac@LAPTOP-RLVRS19J:~/A2$ bash q5
enter a number
4
even
cdac@LAPTOP-RLVRS19J:~/A2$ cat q5

#!/bin/bash

#even odd

echo "enter a number"

read n

if [ $((n % 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.

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q6
cdac@LAPTOP-RLVRS19J:~/A2$ bash q6
1
2
3
4
5
cdac@LAPTOP-RLVRS19J:~/A2$ cat q6

#for loop to print numbers from 1 to 5

#!/bin/bash

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

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q6.1
cdac@LAPTOP-RLVRS19J:~/A2$ bash q6.1
enter n th number
5
------
1
2
3
4
5
cdac@LAPTOP-RLVRS19J:~/A2$ cat q6.1

echo enter n th number
read n
echo ------
#for loop

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

do
        echo $i
done
```

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

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q7
cdac@LAPTOP-RLVRS19J:~/A2$ bash q7
1
2
3
4
5
cdac@LAPTOP-RLVRS19J:~/A2$ cat q7
#!/bin/bash

#while loop

i=1

while [ $i -le 5 ]
do
        echo $i
        ((i++))
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".
Ans:

This is the beginning of an `if` statement. The `[ -f "file.txt" ]` is a test condition that checks if a file named `file.txt` exists and is a regular file (not a directory or a special file).
`-f` is a test operator that returns true if the file exists and is a regular file.

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q8
cdac@LAPTOP-RLVRS19J:~/A2$ bash q8
not exists
cdac@LAPTOP-RLVRS19J:~/A2$ nano q8
cdac@LAPTOP-RLVRS19J:~/A2$ bash q8
exists
cdac@LAPTOP-RLVRS19J:~/A2$ cat q8

#!/bin/bash

if [ -f q2 ]

then
        echo exists
else
        echo not exists
fi
cdac@LAPTOP-RLVRS19J:~/A2$ ls
q1  q2  q3  q4  q5  q6  q6.1  q7  q8
cdac@LAPTOP-RLVRS19J:~/A2$
```

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-RLVRS19J:~/A2$ nano q9
cdac@LAPTOP-RLVRS19J:~/A2$ bash q9
n
4
less than 10
cdac@LAPTOP-RLVRS19J:~/A2$ bash q9
n
11
greater than 10
cdac@LAPTOP-RLVRS19J:~/A2$ bash q9
n
10
equal to 10
cdac@LAPTOP-RLVRS19J:~/A2$ cat q9

#!/bin/bash

echo n
read n

if [ $n -gt 10 ];
then
echo greater than 10
        elif [ $n -eq 10 ];
        then
        echo equal to 10

        else
        echo less than 10
fi
cdac@LAPTOP-RLVRS19J:~/A2$
```

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-RLVRS19J:~/A2$ nano q10
cdac@LAPTOP-RLVRS19J:~/A2$ bash q10
      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-RLVRS19J:~/A2$
```

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.

```
cdac@LAPTOP-RLVRS19J:~/A2$ nano q11
cdac@LAPTOP-RLVRS19J:~/A2$ bash q11
Enter a number (negative number to exit):
1
The square of 1 is 1
Enter a number (negative number to exit):
2
The square of 2 is 4
Enter a number (negative number to exit):
3
The square of 3 is 9
Enter a number (negative number to exit):
-2
Negative number entered. Exiting...
```