linux experiments

Experiment – 1

Aim:

Getting familiar with UNIX/Linux by using at least 10 basic commands.

Commands with Description

1) `pwd` – Prints the current working directory.
Example:

```
pwd
```

2) `ls` – Lists files and folders in a directory.
Example:

```
ls -la
```

3) `cd` – Changes the current directory.
Example:

```
cd Documents
```

4) `mkdir` – Creates a new directory.
Example:

```
mkdir test-folder
```

5) `rmdir` – Removes an empty directory.
Example:

```
rmdir test-folder
```

6) `touch` – Creates an empty file.
Example:

```
touch sample.txt
```

7) `cat` – Displays the content of a file.
Example:

```
cat sample.txt
```

8) `cp` – Copies a file.
Example:

```
cp Sample.txt copy-sample.txt
```

9) `mv` – Moves or renames a file.
Example:

```
mv copy-sample.txt Documents/
```

10) `rm` – Removes a file.
Example:

```
rm sample.txt
```

Output

```
ubuntu@ubuntu:~$ whoami
ubuntu

ubuntu@ubuntu:~$ pwd
/home/ubuntu

ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures
Public   Templates  Videos     snap

ubuntu@ubuntu:~$ cd Documents

ubuntu@ubuntu:~/Documents$ pwd
/home/ubuntu/Documents

ubuntu@ubuntu:~/Documents$ cd ..

ubuntu@ubuntu:~$ mkdir test-folder

ubuntu@ubuntu:~$ touch Sample

ubuntu@ubuntu:~$ cat Sample
hello
```

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2. experiment 2 : Write a shell script to generate a multiplication table

Ans:

Program:

```
#!/bin/bash
echo "Enter a number:"
read num

for i in {1..10}
do
 echo "$num x $i = $((num * i))"
done
```

Output:

```
ubuntu@ubuntu:~$ nano table.sh
ubuntu@ubuntu:~$ chmod +x table.sh
ubuntu@ubuntu:~$ ./table.sh
Enter a number:
5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

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3. Copy multiple files to a directory

Ans:

Program:

```
#!/bin/bash

mkdir source
mkdir destination
touch source/{file1.txt,file2.txt,file3.txt}

echo "Enter source directory:"
```

```
read src

echo "Enter destination directory:"
read dest

if [ -d "$src" ] && [ -d "$dest" ]
then
    cp "$src"/* "$dest"/
    echo "Files copied successfully."
else
    echo "Error: Invalid directory name."
fi
```

Output:

```
ubuntu@ubuntu:~$ nano copyfiles.sh
ubuntu@ubuntu:~$ chmod +x copyfiles.sh
ubuntu@ubuntu:~$ ./copyfiles.sh
Enter source directory:
source
Enter destination directory:
destination
Files copied successfully.
```

4. Factorial of a Number

Ans:

Program:

```
#!/bin/bash

echo "Enter a number:"
read num

fact=1

for ((i=1; i<=num; i++))
do
    fact=$((fact * i))
done

echo "Factorial of $num is $fact"
```

Output:

```
ubuntu@ubuntu:~$ nano fact.sh
ubuntu@ubuntu:~$ chmod +x fact.sh
ubuntu@ubuntu:~$ ./fact.sh
Enter a number:
5
Factorial of 5 is 120
```

✅ Exp 5 — Prime Numbers Between m and n

```
echo "Enter starting number:"
read m

echo "Enter ending number:"
read n

for ((num=m; num<=n; num++))
do
    count=0
    for ((i=2; i<=num/2; i++))
    do
        if [ $((num%i)) -eq 0 ]
        then
            count=1
            break
        fi
    done

    if [ $count -eq 0 ] && [ $num -gt 1 ]
    then
        echo $num
    fi
done
```

▶ Output

```
Enter starting number:
10
Enter ending number:
20
11
13
17
19
```

✅ Exp 7 — Maximum & Minimum Numbers

```
echo "Enter numbers separated by space:"
read -a arr

max=${arr[0]}
min=${arr[0]}

for num in "${arr[@]}"
do
    if [ $num -gt $max ]
    then
        max=$num
    fi

    if [ $num -lt $min ]
    then
        min=$num
    fi
done

echo "Maximum: $max"
echo "Minimum: $min"
```

▶ Output

```
Enter numbers separated by space:
4 9 2 15 7
Maximum: 15
Minimum: 2
```

✅ Exp 8 — Palindrome Check

```
echo "Enter a string:"
read str

reverse=$(echo $str | rev)

if [ "$str" = "$reverse" ]
then
    echo "Palindrome"
else
    echo "Not a Palindrome"
fi
```

▶ Output

```
Enter a string:
```

```
madam
Palindrome
```

✅ Exp 9 — Count Vowels

```
echo "Enter a string:"
read str

count=0

for ((i=0; i<${#str}; i++))
do
    char=${str:$i:1}

    case $char in
        [aeiouAEIOU])
            count=$((count + 1))
            ;;
    esac
done

echo "Total vowels: $count"
```

▶ Output

```
Enter a string:
Hello World
Total vowels: 3
```

✅ Exp 10 — Simple Interest

```
echo "Enter Principal:"
read p

echo "Enter Rate:"
read r

echo "Enter Time:"
read t

si=$((p * r * t / 100))

echo "Simple Interest is $si"
```

▶ Output

```
Enter Principal:
1000
Enter Rate:
5
Enter Time:
2
Simple Interest is 100
```
