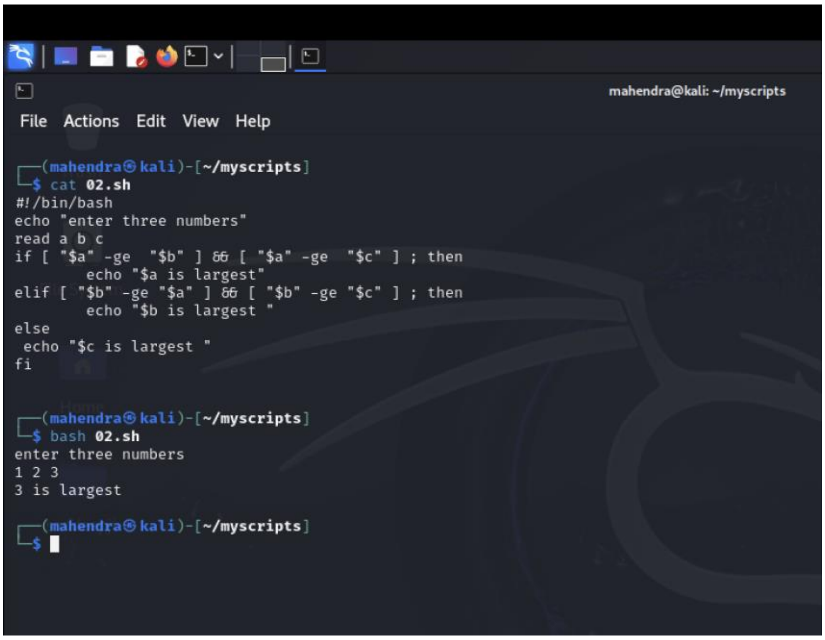
4ITRC2 Operating System Lab

Lab Assignment 3

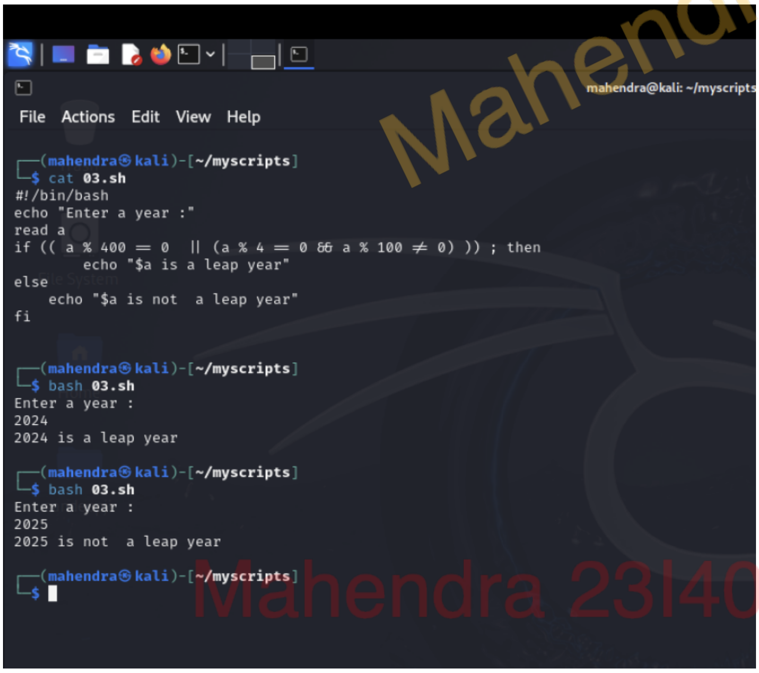
Create shell scripts for the following questions

1. **To find Largest of Three Numbers**



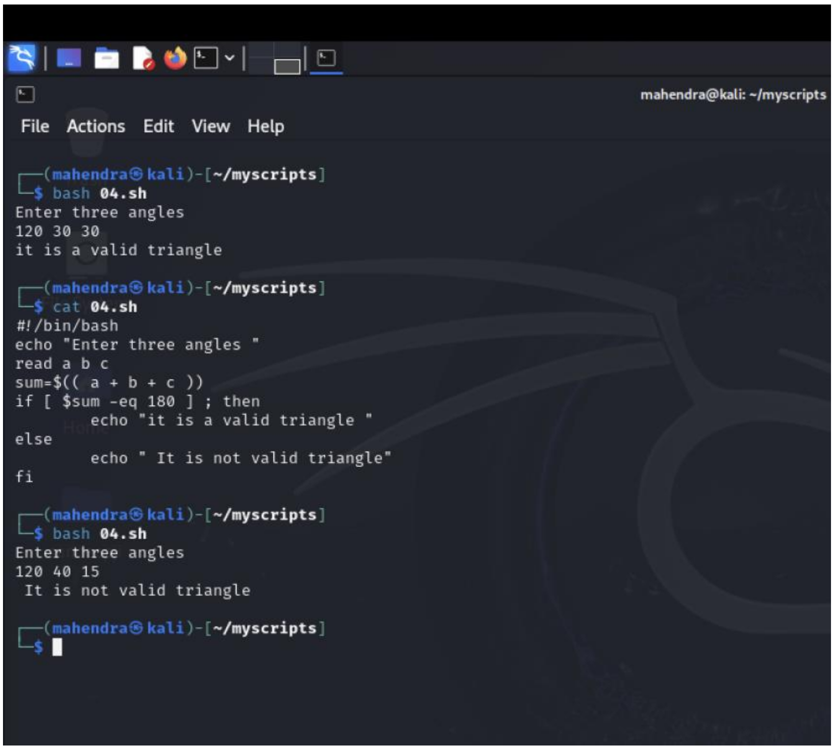
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 02.sh
#!/bin/bash
echo "enter three numbers"
read a b c
if [ "$a" -ge  "$b" ] && [ "$a" -ge  "$c" ] ; then
        echo "$a is largest"
elif [ "$b" -ge "$a" ] && [ "$b" -ge "$c" ] ; then
        echo "$b is largest "
else
 echo "$c is largest "
fi

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 02.sh
enter three numbers
1 2 3
3 is largest

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

2. To find a year is leap year or not



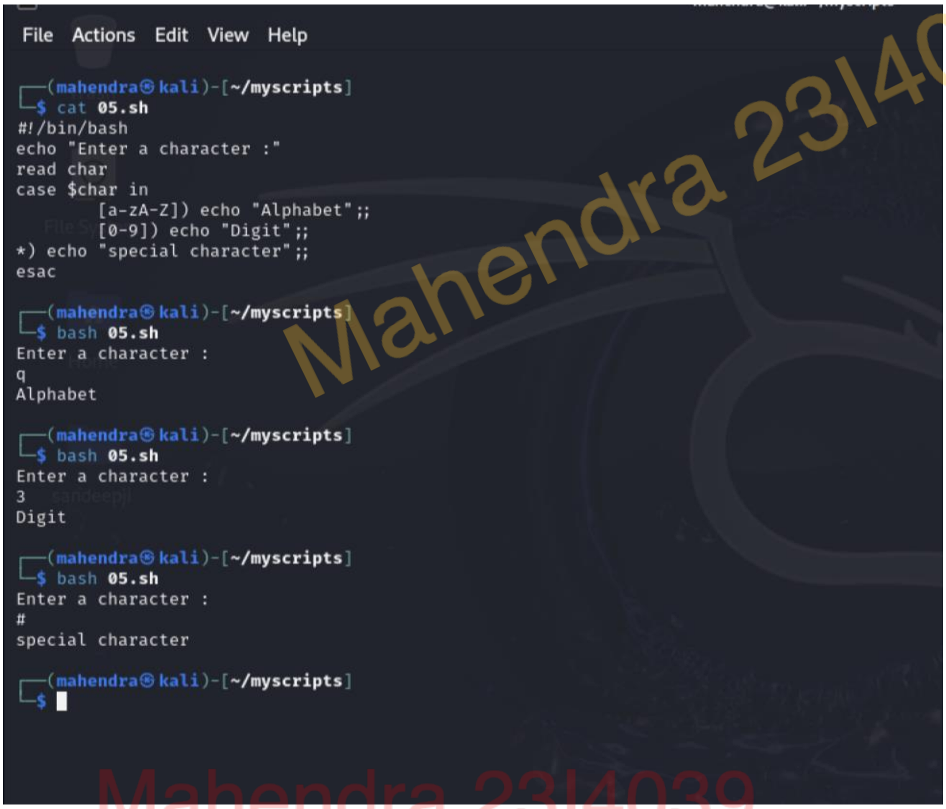
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 03.sh
#!/bin/bash
echo "Enter a year :"
read a
if (( a % 400 == 0  || (a % 4 == 0 && a % 100 != 0) )) ; then
        echo "$a is a leap year"
else
    echo "$a is not  a leap year"
fi

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 03.sh
Enter a year :
2024
2024 is a leap year

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 03.sh
Enter a year :
2025
2025 is not  a leap year

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

3. To input angles of a triangle and find out whether it is valid triangle or not



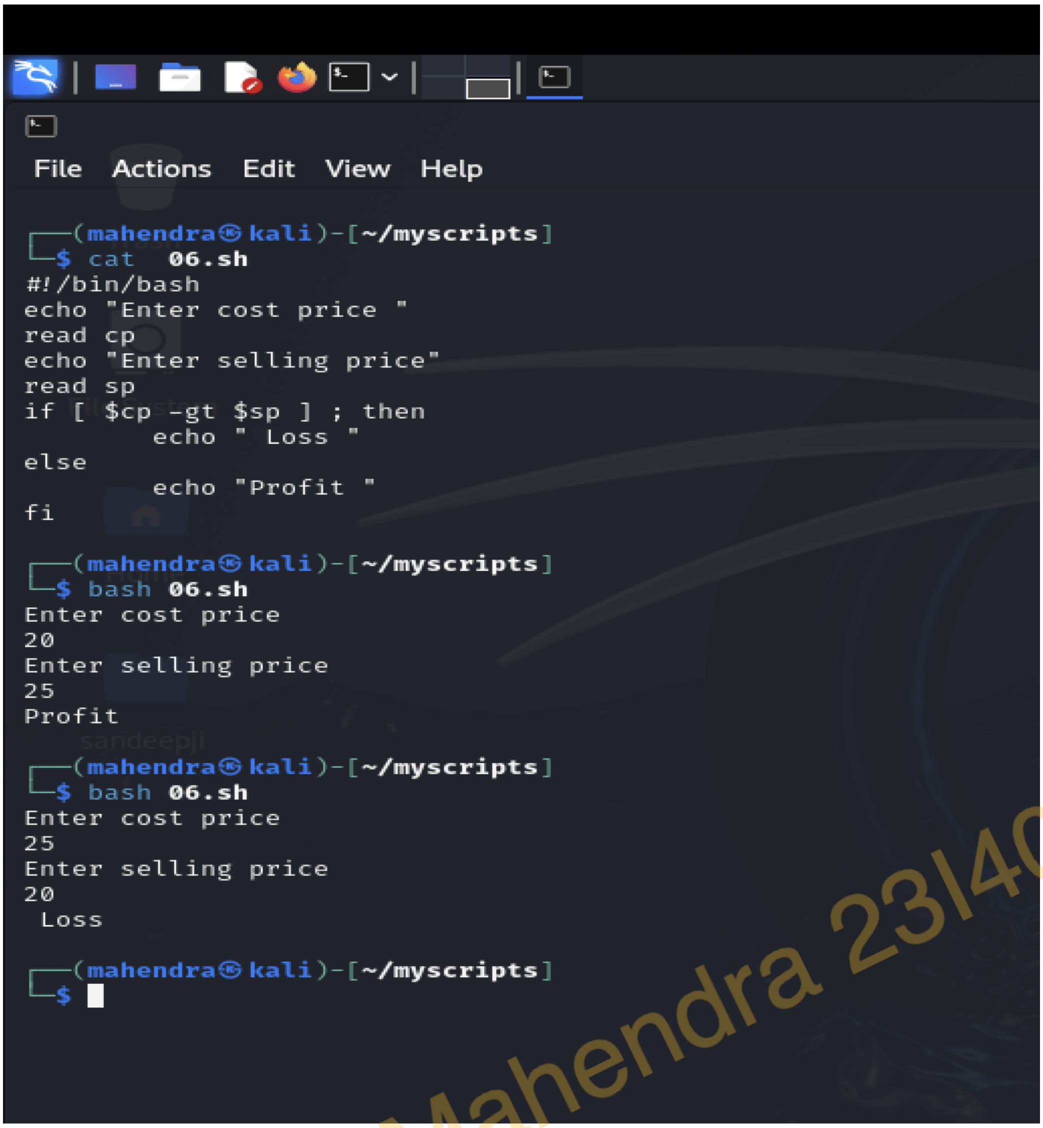
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 04.sh
Enter three angles
120 30 30
it is a valid triangle

┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 04.sh
#!/bin/bash
echo "Enter three angles "
read a b c
sum=$(( a + b + c ))
if [ $sum -eq 180 ] ; then
        echo "it is a valid triangle "
else
        echo " It is not valid triangle"
fi

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 04.sh
Enter three angles
120 40 15
 It is not valid triangle

┌──(mahendra㉿kali)-[~/myscripts]
└─$ █
```

4. To check whether a character is alphabet, digit or special character.



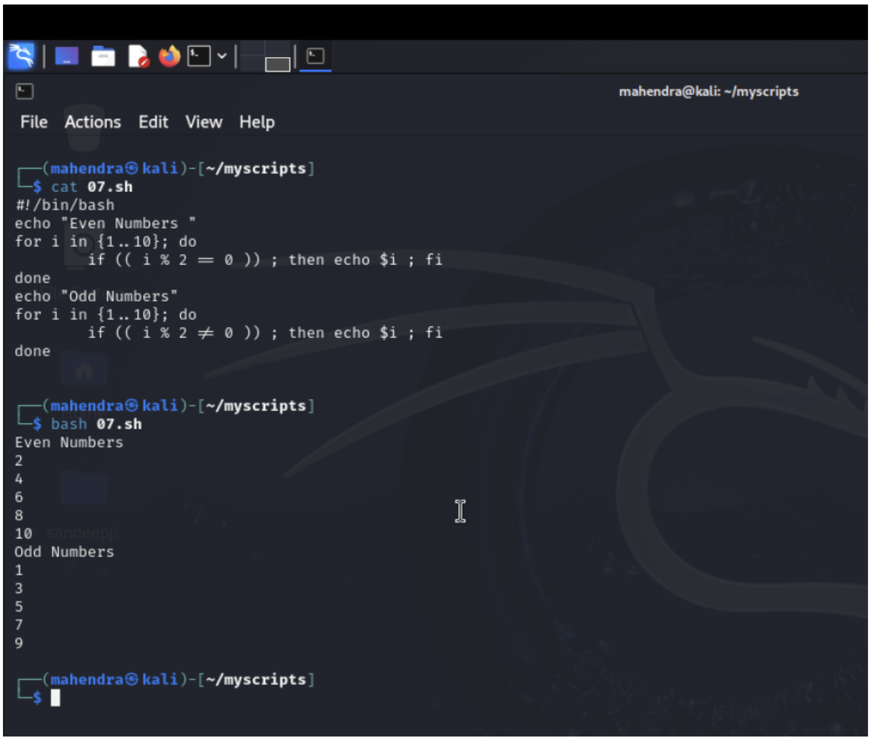
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 05.sh
#!/bin/bash
echo "Enter a character :"
read char
case $char in
        [a-zA-Z]) echo "Alphabet";;
        [0-9]) echo "Digit";;
*) echo "special character";;
esac

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 05.sh
Enter a character :
q
Alphabet

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 05.sh
Enter a character :
3
Digit

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 05.sh
Enter a character :
#
special character

┌──(mahendra㉿kali)-[~/myscripts]
└─$ █
```

5. To calculate profit or loss



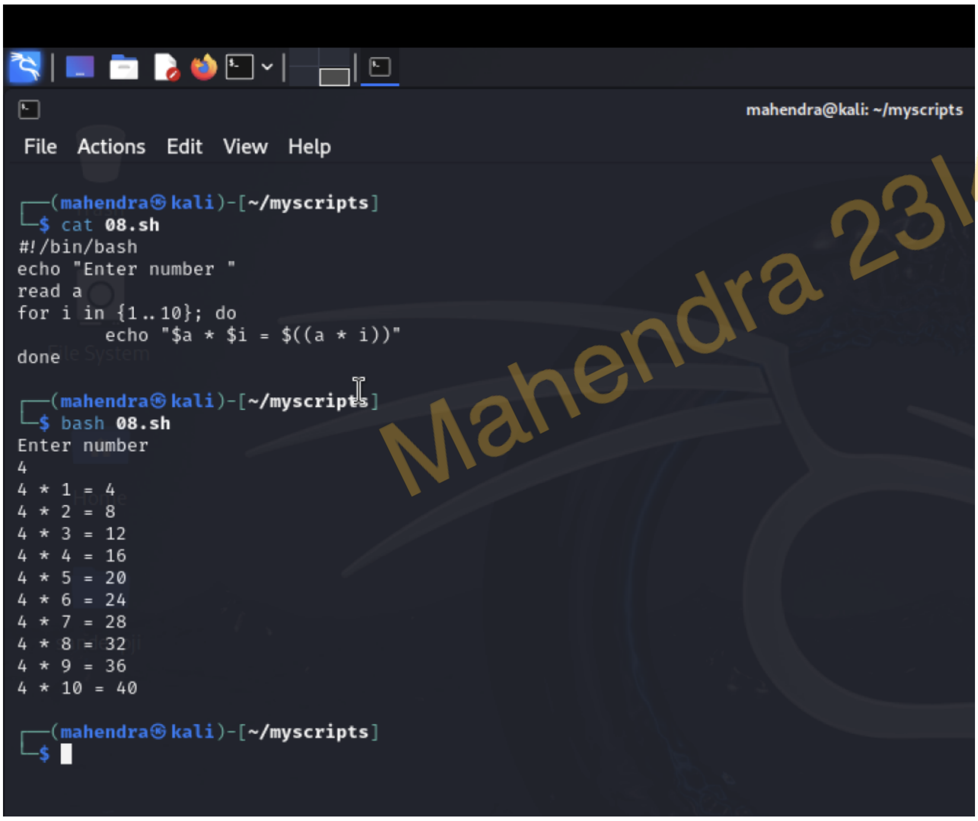
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat  06.sh
#!/bin/bash
echo "Enter cost price "
read cp
echo "Enter selling price"
read sp
if [ $cp -gt $sp ] ; then
        echo " Loss "
else
        echo "Profit "
fi

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 06.sh
Enter cost price
20
Enter selling price
25
Profit

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 06.sh
Enter cost price
25
Enter selling price
20
 Loss

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

6. To print all even and odd number from 1 to 10



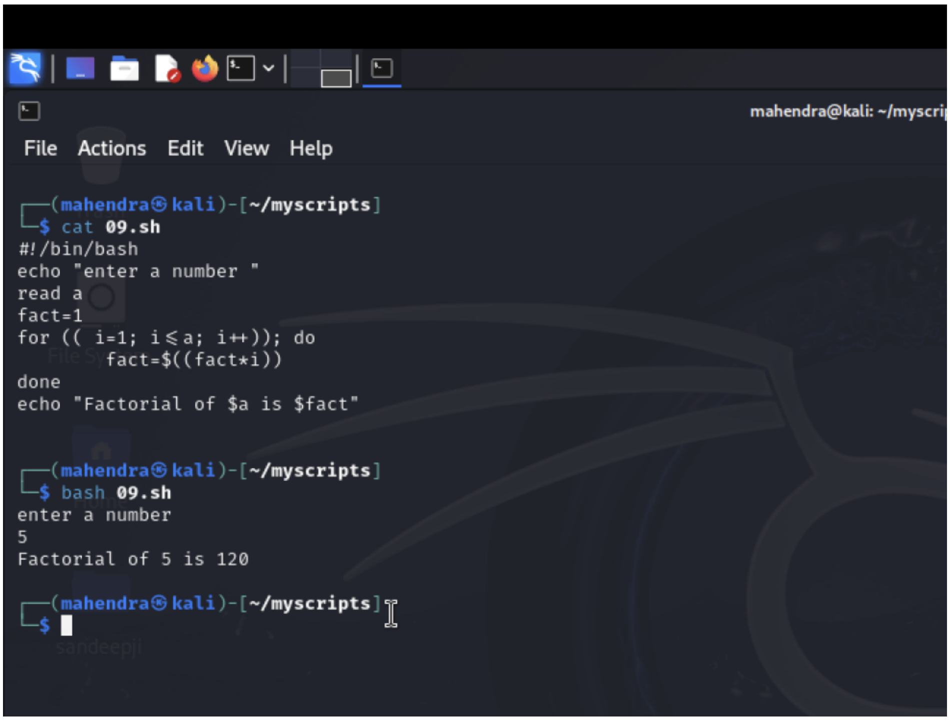
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 07.sh
#!/bin/bash
echo "Even Numbers "
for i in {1..10}; do
        if (( i % 2 == 0 )) ; then echo $i ; fi
done
echo "Odd Numbers"
for i in {1..10}; do
        if (( i % 2 != 0 )) ; then echo $i ; fi
done

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 07.sh
Even Numbers
2
4
6
8
10
Odd Numbers
1
3
5
7
9

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

7. To print table of a given number



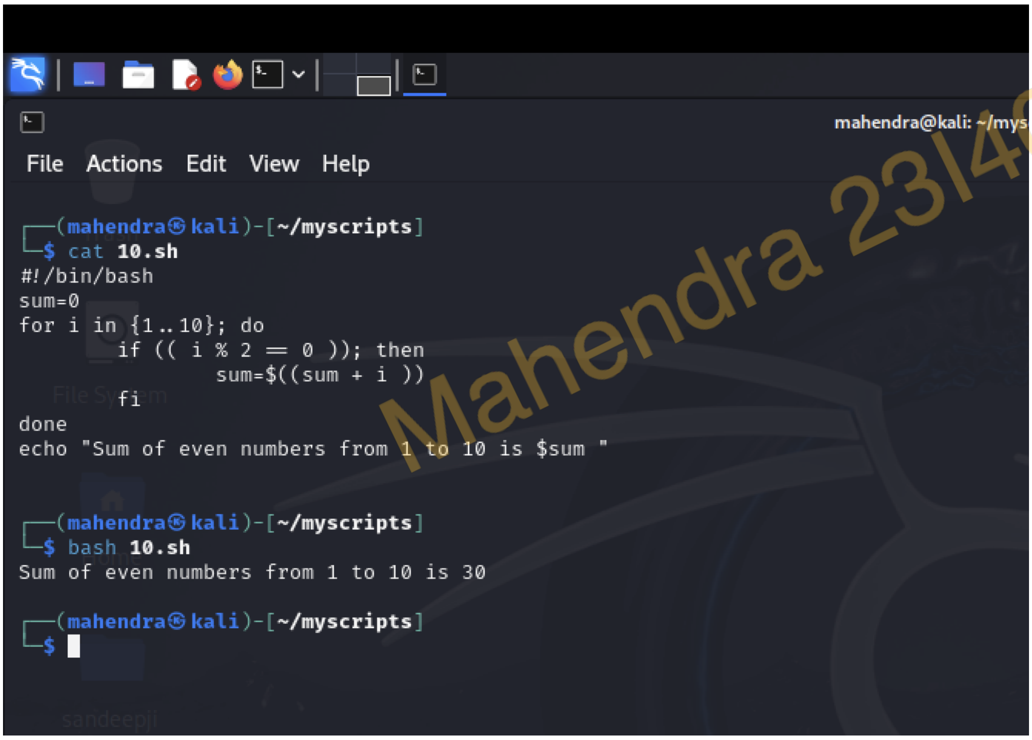
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 08.sh
#!/bin/bash
echo "Enter number "
read a
for i in {1..10}; do
        echo "$a * $i = $((a * i))"
done

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 08.sh
Enter number
4
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
4 * 10 = 40

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

8. To find factorial of a given integer



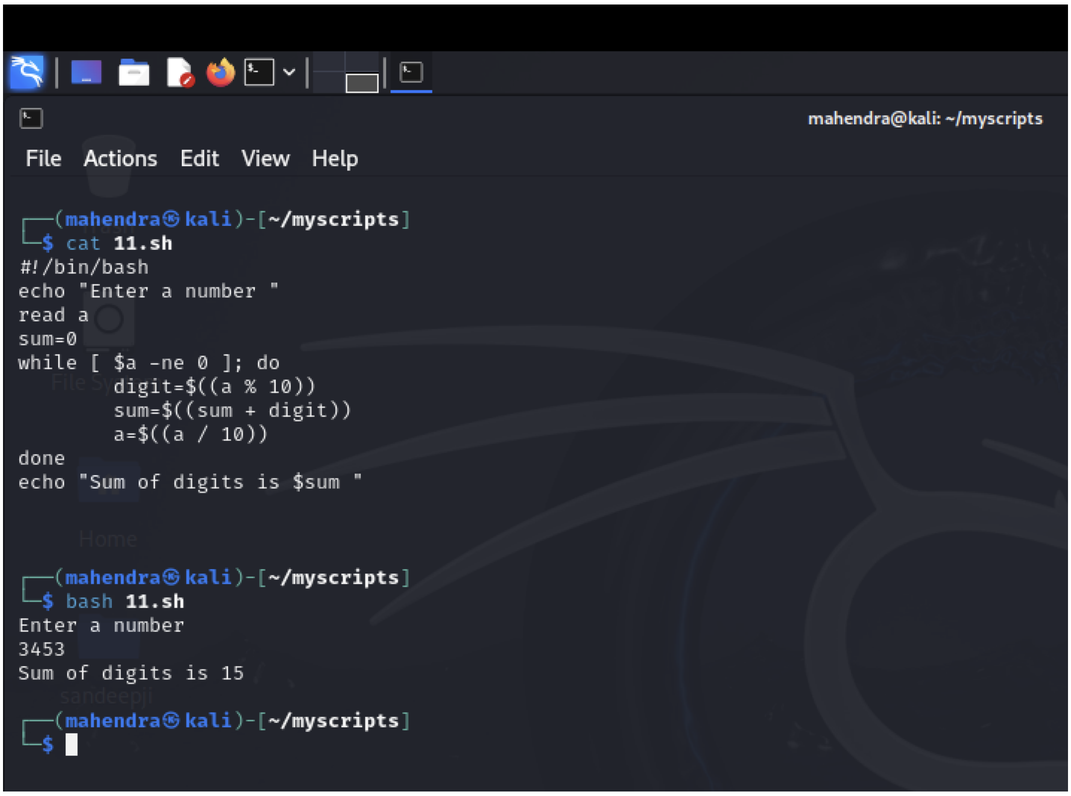
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 09.sh
#!/bin/bash
echo "enter a number "
read a
fact=1
for (( i=1; i<=a; i++)); do
        fact=$((fact*i))
done
echo "Factorial of $a is $fact"

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 09.sh
enter a number
5
Factorial of 5 is 120

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

9. To print sum of all even numbers from 1 to 10.



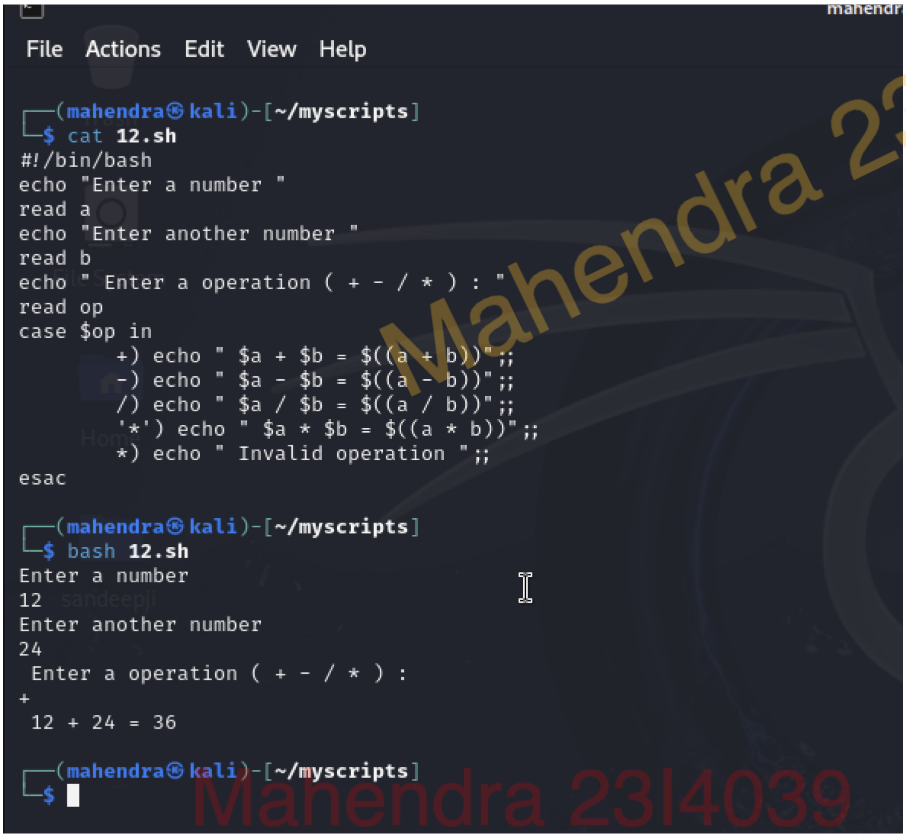
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 10.sh
#!/bin/bash
sum=0
for i in {1..10}; do
        if (( i % 2 == 0 )); then
                sum=$((sum + i ))
        fi
done
echo "Sum of even numbers from 1 to 10 is $sum "

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 10.sh
Sum of even numbers from 1 to 10 is 30

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

10. To print sum of digit of any number.



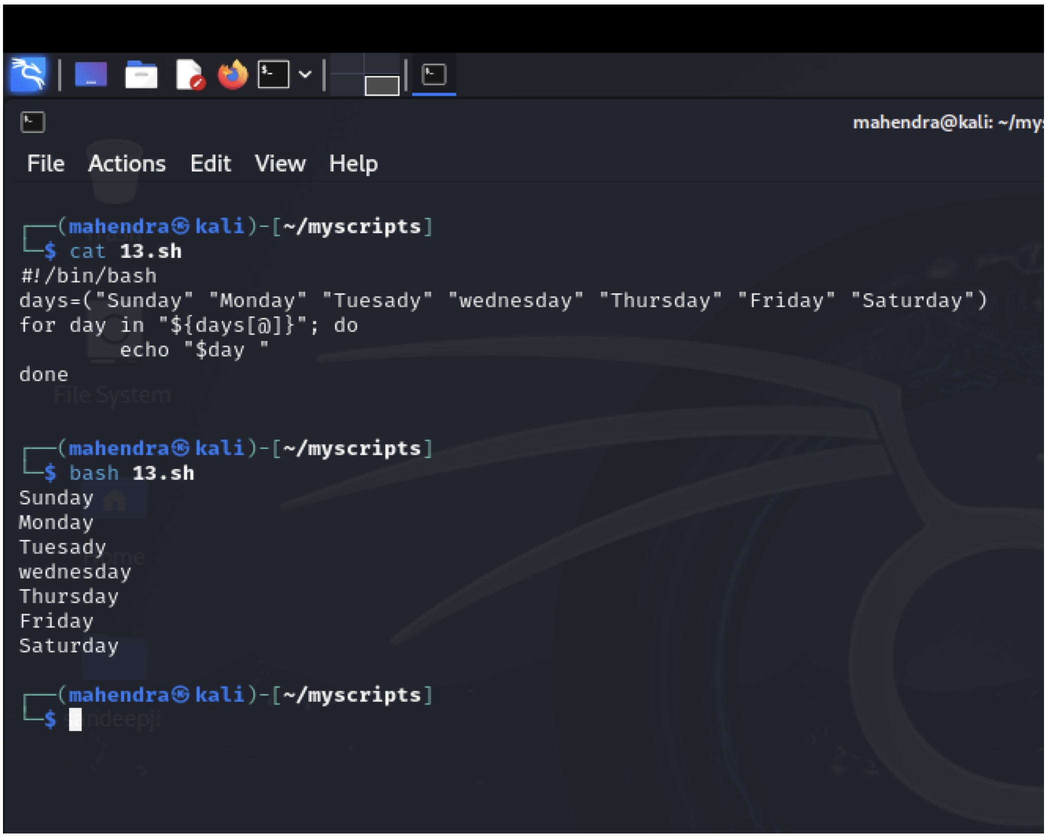
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 11.sh
#!/bin/bash
echo "Enter a number "
read a
sum=0
while [ $a -ne 0 ]; do
        digit=$((a % 10))
        sum=$((sum + digit))
        a=$((a / 10))
done
echo "Sum of digits is $sum "


┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 11.sh
Enter a number
3453
Sum of digits is 15

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

11. To make a basic calculator which performs addition, subtraction, Multiplication, division



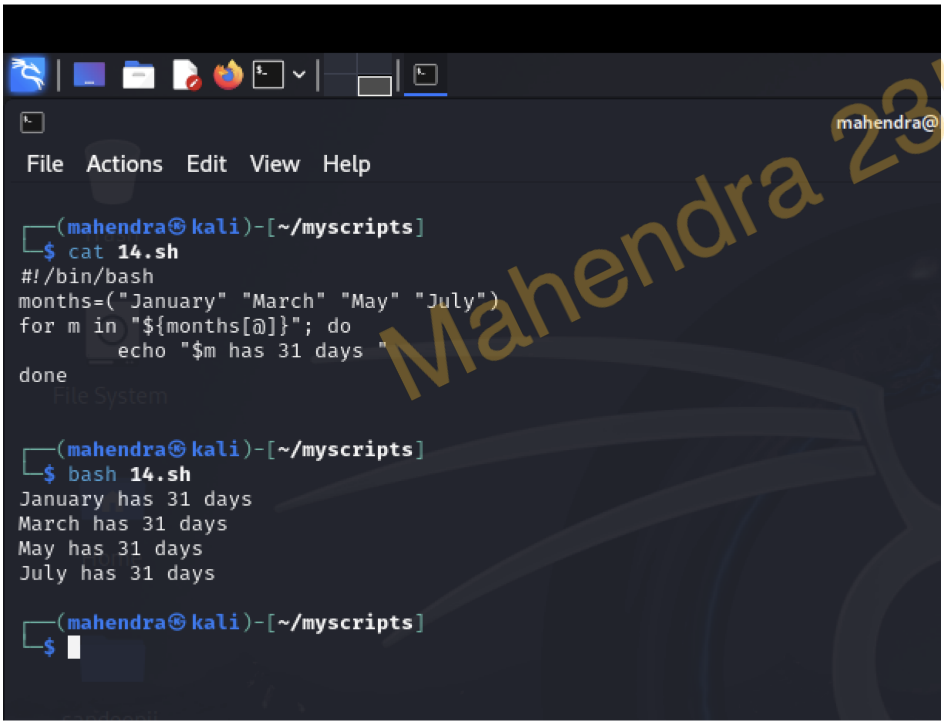
```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 12.sh
#!/bin/bash
echo "Enter a number "
read a
echo "Enter another number "
read b
echo " Enter a operation ( + - / * ) : "
read op
case $op in
        +) echo " $a + $b = $((a + b))";;
        -) echo " $a - $b = $((a - b))";;
        /) echo " $a / $b = $((a / b))";;
        '*') echo " $a * $b = $((a * b))";;
        *) echo " Invalid operation ";;
esac

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 12.sh
Enter a number
12
Enter another number
24
 Enter a operation ( + - / * ) :
+
 12 + 24 = 36

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

12. To print days of a week.



```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 13.sh
#!/bin/bash
days=("Sunday" "Monday" "Tuesady" "wednesday" "Thursday" "Friday" "Saturday")
for day in "${days[@]}"; do
        echo "$day "
done

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 13.sh
Sunday
Monday
Tuesady
wednesday
Thursday
Friday
Saturday

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

13. To print starting 4 months having 31 days.



```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 14.sh
#!/bin/bash
months=("January" "March" "May" "July")
for m in "${months[@]}"; do
        echo "$m has 31 days "
done

┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 14.sh
January has 31 days
March has 31 days
May has 31 days
July has 31 days

┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```

14. Using functions,

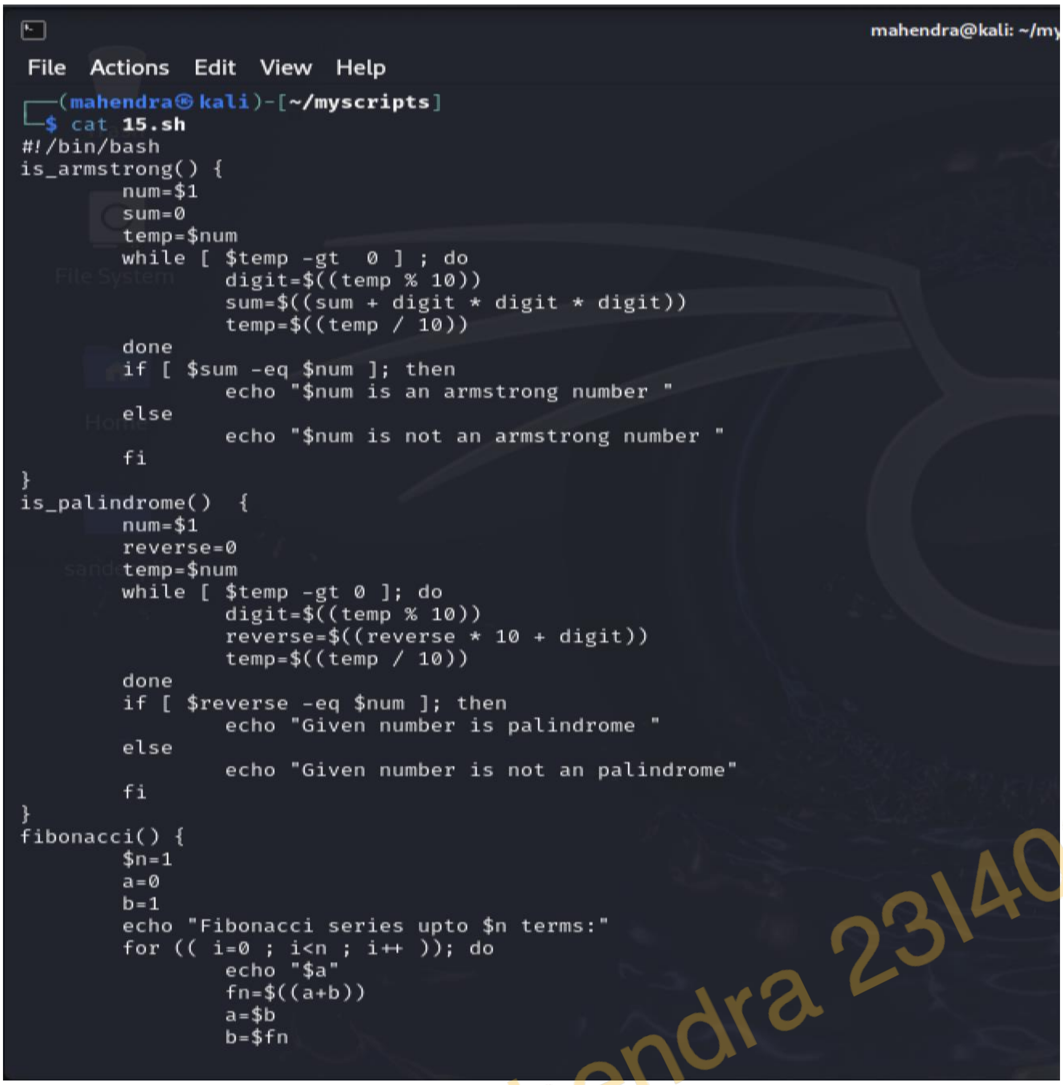
a. To find given number is Amstrong number or not

b. To find whether a number is palindrome or not

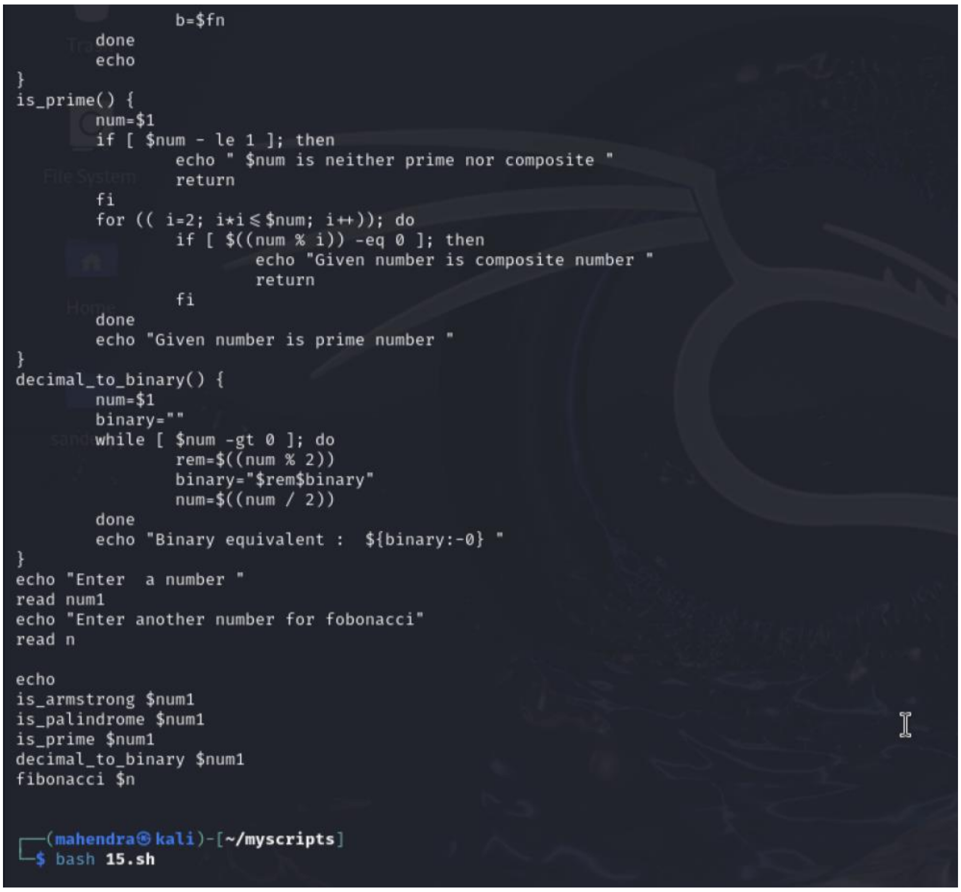
c. To print Fibonacci series upto n terms

d. To find given number is prime or composite

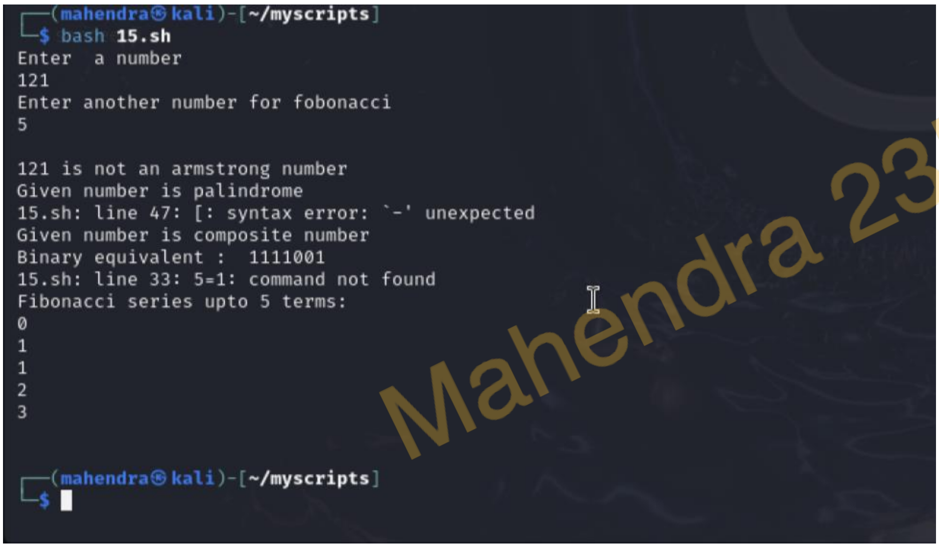
e. To convert a given decimal number to binary equivalent



```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ cat 15.sh
#!/bin/bash
is_armstrong() {
        num=$1
        sum=0
        temp=$num
        while [ $temp -gt  0 ] ; do
                digit=$((temp % 10))
                sum=$((sum + digit * digit * digit))
                temp=$((temp / 10))
        done
        if [ $sum -eq $num ]; then
                echo "$num is an armstrong number "
        else
                echo "$num is not an armstrong number "
        fi
}
is_palindrome()  {
        num=$1
        reverse=0
        temp=$num
        while [ $temp -gt 0 ]; do
                digit=$((temp % 10))
                reverse=$((reverse * 10 + digit))
                temp=$((temp / 10))
        done
        if [ $reverse -eq $num ]; then
                echo "Given number is palindrome "
        else
                echo "Given number is not an palindrome"
        fi
}
fibonacci() {
        $n=1
        a=0
        b=1
        echo "Fibonacci series upto $n terms:"
        for (( i=0 ; i<n ; i++ )); do
                echo "$a"
                fn=$((a+b))
                a=$b
                b=$fn
```



```
                b=$fn
        done
        echo
}
is_prime() {
        num=$1
        if [ $num - le 1 ]; then
                echo " $num is neither prime nor composite "
                return
        fi
        for (( i=2; i*i<=$num; i++)); do
                if [ $((num % i)) -eq 0 ]; then
                        echo "Given number is composite number "
                        return
                fi
        done
        echo "Given number is prime number "
}
decimal_to_binary() {
        num=$1
        binary=""
        while [ $num -gt 0 ]; do
                rem=$((num % 2))
                binary="$rem$binary"
                num=$((num / 2))
        done
        echo "Binary equivalent :  ${binary:-0} "
}
echo "Enter  a number "
read num1
echo "Enter another number for fobonacci"
read n

echo
is_armstrong $num1
is_palindrome $num1
is_prime $num1
decimal_to_binary $num1
fibonacci $n


┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 15.sh
```



```
┌──(mahendra㉿kali)-[~/myscripts]
└─$ bash 15.sh
Enter  a number
121
Enter another number for fobonacci
5

121 is not an armstrong number
Given number is palindrome
15.sh: line 47: [: syntax error: `-' unexpected
Given number is composite number
Binary equivalent :  1111001
15.sh: line 33: 5=1: command not found
Fibonacci series upto 5 terms:
0
1
1
2
3


┌──(mahendra㉿kali)-[~/myscripts]
└─$ 
```