

1. Design a Python script to convert a Binary number to Decimal number and verify if it is a Perfect number.

```
num = list(input("Input a binary number: "))

value = 0

sum=0

for i in range(len(num)):

    digit = num.pop()

    if digit == '1':

        value = value + pow(2, i)

print("The decimal value of the number is", value)

for i in range(1,value):

    if(value%i==0):

        sum=sum+i

if(sum==value):

    print("the value is perfect no")

else:

    print("the given value is not perfect no")
```

2 Design a Python script to determine if a given string is a Palindrome using recursion

```
def reverse(str1):
```

```
    if(len(str1)==0):
```

```
        return str1
```

```
    else:
```

```
return reverse(str1[1:])+str1[0]
```

```
string=input("Please enter your own String : ")
```

```
str1=reverse(string)
```

```
print("String in reverse Order : ", str1)
```

```
if(string==str1):
```

```
    print("This is a Palindrome String")
```

```
else:
```

```
    print("This is Not a Palindrome String")
```

3 Cose series

```
import math
```

```
def cosine(x,n):
```

```
    cosx = 1
```

```
    sign = -1
```

```
    for i in range(2, n, 2):
```

```
        pi=22/7
```

```
        y=x*(pi/180)
```

```
        cosx = cosx + (sign*(y**i))/math.factorial(i)
```

```
        sign = -sign
```

```
    returncosx
```

```
x=int(input("Enter the value of x in degrees:"))
```

```
n=int(input("Enter the number of terms:"))
```

```
print(round(cosine(x,n),2))
```

4. Sin series

```
import math
```

```
def sin(x,n):
```

```
    sine = 0
```

```
    for i in range(n):
```

```
        sign = (-1)**i
```

```
        pi=22/7
```

```
        y=x*(pi/180)
```

```
        sine = sine + ((y**(2.0*i+1))/math.factorial(2*i+1))*sign
```

```
    return sine
```

```
x=int(input("Enter the value of x in degrees:"))
```

```
n=int(input("Enter the number of terms:"))
```

```
print(round(sin(x,n),2))
```

5. Design a Python Script to convert a given number to roman number.

def Roman(no):

```
    val = [1000, 900, 500, 400,  
           100, 90, 50, 40,  
           10, 9, 5, 4, 1]
```

```
    syb = ["M", "CM", "D", "CD",  
           "C", "XC", "L", "XL",  
           "X", "IX", "V", "IV",  
           "I"]
```

```
    romannum = ""
```

```
    i = 0
```

```
    while(no > 0):
```

```
        for _ in range(no // val[i]):
```

```
            romannum += syb[i]
```

```
        no -= val[i]
```

```
        i += 1
```

```
    return romannum
```

```
no=int(input("enter a no to convert into roman no"))
```

```
print(Roman(no))
```

6 .BarChart program

```
import turtle

def drawBar(t, height, color):

    t.fillcolor(color)
    t.begin_fill()
    t.left(90)
    t.forward(height)
    t.write(str(height))
    t.right(90)
    t.forward(40)
    t.right(90)
    t.forward(height)
    t.left(90)

    t.end_fill()

xs = [48, 117, 200, 96, 134, 260, 99]
clrs = ["green", "red", "yellow", "black",
        "pink", "brown", "blue"]

maxheight = max(xs)
numbers = len(xs)
border = 10

# Set up the window and its
# attributes
wn = turtle.Screen()
wn.setworldcoordinates(0 - border, 0 - border,
                       40 * numbers + border,
                       maxheight + border)

# Create tess and set some attributes
tess = turtle.Turtle()
tess.pensize(3)

for i in range(len(xs)):

    drawBar (tess, xs[i],
             clrs[i])

wn.exitonclick()
```

