n=int(input("enter the year:"))

(n%400==0) and (n%100==0):

print("leap year")

elif(n%4==0)and(n%100!=0):

print("leap year")

else:

print("not a leap year")

2. r=int(input("enter the radius value:"))

area\_circle=3.14\*r\*r

print("Area of circle:",area\_circle)

base=int(input("enter the base of the triangle:"))

height=int(input("enter the height of the triangle:"))

area\_triangle=0.5\*base\*height

print("Area of triangle:", area\_triangle)

3. p=int(input("enter the principle amount:"))

r=int(input("enter the rate:"))

t=int(input("enter the time:"))

simple=int(p\*(r/100)\*t)

compound=round((p\*(1+r/100)\*\*t)-p)

print("simple:",simple)

print("compound:", compound)

4. n=int(input("enter the number:"))

if(n%2==0):

print("even number")

else:

print("odd number")

5. n=int(input("enter n: "))

if n>0:

print("positive")

else:

print("negative")

6. binary=input("enter a binary number:")

decimal=int(binary,2)

octal=oct(decimal)

print("decimal:",decimal)

print("octal:",octal)

7. n=int(input("enter the marks"))

if n>=90:

print("the grade A")

elif n>=80:

print("the grade B")

elif n>=70:

print("the grade C")

elif n>=60:

print("the grade D")

else:

print("fail")

8. import itertools

n=input("enter the number:")

res=list(itertools.permutations(n))

for i in res:

print(''.join(i))

9.PRINT SUM OF SERIES

n=int(input("enter the number:"))

sum=0

for i in range(n+1):

sum+=i

print("sum is:", sum)

10. SUM OF SQUARES

n=int(input("enter the number:"))

sum=0

for i in range(n+1):

sum+=i\*\*2

print("sum:" , sum)

11. FACTORIAL

n=int(input("enter the number:"))

fact=1

for i in range(1, n+1):

fact\*=i

print("factorial:",fact)

12. SUM OF THE SERIES

n=int(input("enter the number:"))

fac=1

sum=0

for i in range(1, n+1):

fac\*=i

sum+=fac

print("factorial sum:",sum)

13.PRINT PATTERN

n=int(input("enter the number:"))

fact=1

for i in range(1, n+1):

fact\*=i

print("factorial:",fact)

14.PRINT PATTERN

rows = int(input("Enter the number of rows: "))

for i in range(1, rows + 1):

for j in range(1, i + 1):

print("+", end=" ")

print()

15.FIBONACCI SERIES

n=int(input("enter a number"))

first=0

second=1

print("fibanocci sequence:")

for i in range(n):

print(first,end=' ')

first,second=second,first+second

16.ADDITION OF TWO NUMBERS

a= [[1,2], [3,4]]

b= [[5,6], [7,8]]

res= [[0,0], [0,0]]

for i in range(len(a)):

for j in range (len (a)):

res[i][j] =a[i][j]+b[i][j]

print ("sum:", res)

17.MULTLIPLICATION OF TWO MATRIX

a= [[1,2], [4,1]]

b= [[5,6], [7,8]]

res= [[0,0], [0,0]]

for i in range(len(a)):

for j in range (len(b)):

for k in range (len(res)):

res[i][j]+=a[i][k]\*b[k][j]

print ("product matrix:", res)

18.TRANSPOSE A MATRIX

a= [[1,2], [3,4]]

res= [[0,0], [0,0]]

for i in range(len(a)):

for j in range (len (res)):

res[i][j] =a[j][i]

print ("Transpose matrix:", res)

19.PERFORM LIST OPERATIONS

a=[5,9,3,4,1,6]

print ("sort:",sorted(a) )

print("reverse:", a[::-1])

print("max:", max(a))

print("min:",min(a))

print("length:",len(a))

20.COUNT THE NUMBER OF OCCURANCE

a=[1,2,3,3,4,5,5]

n=int(input("Enter the value to count the occurance"))

count=0

for i in a:

if i==n:

count=count+1

print(count)

21.INDEX OF AN ELEMENT

a=[1,2,3,4,5,6]

n=int(input("enter an element to find its index value:"))

for i in range(len(a)):

if n==a[i]:

print(i)

22.ODD OR EVEN

a=[1,2,4,3]

even=[]

odd=[]

for i in a:

if i%2==0:

even.append(i)

else:

odd.append(i)

print("odd: ",odd)

print("even:",even)

23.DUPLICATE IN ARRAY

a=[1,2,2,3,4,5,5,6]

v=[]

for i in range(len(a)):

for j in range(len(a)):

if i!=j:

if a[i]==a[j]:

if a[i] in v:

break

else:

v.append(a[i])

print("duplicate elements are:",v)

24.MULTLIPLICATION TABLE

n=int(input("enter n: "))

for i in range(1,11):

print(i,"\*",n,"=",n\*i)

25.VOWELS AND CONSONANTS IN A STRING

a=input("enter a string: ")

b="aeiouAEIOU"

vow=0

const=0

space=0

for i in a:

if i in b:

vow+=1

elif i.isspace():

space+=1

else:

const+=1

print("no of vowels:",vow)

print("no. of consonants:",const)

26.STRING OPERATIONS

#concatination

a="hello"

b="world"

c= a+b

print(c)

#reverse

c=c[::-1]

print(c)

#length

length=len(c)

print("length:",length)

#slice

d=c[::2]

print(d)

27.SUBSTRING

a=input("enter string: ")

b=input("enter substring: ")

if b in a:

print("yes it is a substring")

else:

print("not a substring")

28.UPPERCASE AND LOWERCASE

a=input("enter string:")

print("uppercase:",a.upper())

print("lowercase:",a.lower())

29.PALINDROME

a=input("enter string:")

b=a[::-1]

if a==b:

print("palindrome")

else:

print("not a palindrome")

30.NO OF WORDS IN A STRING

n=input("enter string: ")

b=n.split()

print(b)

print("no of words:",len(b))

31.PERFECT NUMBER

n = int(input("Enter any Number: "))

Sum = 0

for i in range(1, n):

if(n% i == 0):

Sum = Sum + i

if (Sum == n):

print("Perfect Number")

else:

print(" not a Perfect Number" )

32.ARMSTRONG

n=int(input("enter n: "))

a=[int(i) for i in str(n)]

sum=0

for i in a:

sum+=i\*\*3

if sum==n:

print("amstrong number")

else:

print("not a amstrong number")

33.PRIME OR NOT

n=int(input("enter n:"))

flag=0

for i in range(2,n):

if n%i==0:

print("non prime")

break

else:

print("prime")

34.COMPOSITE OR NOT

n=int(input("enter n:"))

flag=0

for i in range(2,n):

if n%i==0:

print("composite")

break

else:

print("non composite")

35.HARSHAD NUMBER

num=int(input("Enter the number:"))

Sum=0

temp=num

while temp>0:

digit=temp%10

Sum+=digit

temp=temp//10

if num%Sum==0:

print("Harshad Number")

else:

print("Not a Harshad Number")

36.MEAN MEDIAN MODE

import statistics

a=[1,2,3,4,5,5]

mean=statistics.mean(a)

print(mean)

median=statistics.median(a)

print(median)

mode=statistics.mode(a)

print(mode

37. LCM GCD

import math

a=int(input("Enter the a value"))

b=int(input("Enter the b value"))

c=math.lcm(a,b)

d=math.gcd(a,b)

print("LCM value=",c)

print("GCD value=",d)

38.BONUS SALARY

grade=input("enter the grade of the employee:")

salary=float(input("enter the employee salary"))

bonus=0

if grade=='A':

bonus=salary\*0.05

elif grade=='B':

bonus==salary\*0.1

if salary<10000:

bonus+=salary\*0.02

total\_salary=salary+bonus

print("salary=",salary)

print("bonus=",bonus)

print("total to be paid:",total\_salary)

39.HALLOW SQUARE

num=int(input("enter number"))

for i in range(0,num):

for j in range(0,num):

if i==0 or j==0 or j==num-1 or i==num-1:

print("$",end="")

else:

print(" ",end="")

print()

40.HAPPY NUMBER

n=int(input("enter the number:"))

sum=0

rem=0

while(n>0):

rem=n%10

sum=sum+rem\*rem

n=n//10

if (sum==1):

print("n is happy number")

else:

print("n is not a happy number")

41.ARMSTRONG

num=int(input("enter the number"))

sum=0

temp= num

while temp>0:

digit=temp%10

sum+=digit\*\*3

temp=temp//10

if num==sum:

print("armstrong number",num)

else:

print("not a armstrong number",num)

42.ISOMERPHIC

def is\_isomorphic(s, t):

return len(set(zip(s, t))) == len(set(s)) == len(set(t))

# Example usage

s = "egg"

t = "add"

print(is\_isomorphic(s, t)) # Output: True

43.PYTHROGREAN

Import math

p=int(input(“enter the number”))

q=int(input(“enter the number”))

a=p\*p

b=q\*q

c=a+b

r=math.sqrt©

print(c)

44.TECH OR NOT

def is\_tech\_number(n):

s = str(n)

if len(s) % 2 == 0:

half = len(s) // 2

return (int(s[:half]) + int(s[half:])) \*\* 2 == n

return False

# Example usage

n = 2025

print(is\_tech\_number(n)) # Output: True

45.SIMPLE INTEREST

def simple\_interest(p, t, senior):

rate = 15 if senior else 12

return (p \* rate \* t) / 100

print(simple\_interest(10000, 5, True))

print(simple\_interest(10000, 5, False))

46.BINARY STRING

def add\_binary(a, b):

return bin(int(a, 2) + int(b, 2))[2:]

a = "101"

b = "110"

print(add\_binary(a, b)) # Output: "1011"

47. GREATEST BINARY

def greatest\_binary(a, b, c):

return bin(max(int(a, 2), int(b, 2), int(c, 2)))[2:]

# Example usage

print(greatest\_binary("101", "110", "111")) # Output: "111"

48.REVERSE NUMBER

def arrange\_letters(word):

return ''.join(sorted(word)), ''.join(sorted(word, reverse=True))

print(arrange\_letters("python")) # Output: ('hnopty', 'ytponh')