

Python program to check whether the given number is even or not.

```
number = input("Enter a number ")
```

```
x = int(number)%2
```

```
if x == 0:
```

```
    print(" The number is Even ")
```

```
else:
```

```
    print(" The number is odd ")
```

Python program to convert the temperature in degree centigrade to Fahrenheit

```
c = input(" Enter temperature in Centigrade: ")
```

```
f = (9*(int(c))/5)+32
```

```
print(" Temperature in Fahrenheit is: ", f)
```

Python program to check whether the given integer is a multiple of 5

```
number = int(input("Enter an integer: "))
```

```
if(number%5==0):
```

```
    print(number, "is a multile of 5")
```

```
else:
```

```
    print(number, "is not a multiple of 5")
```

Python program to check whether the given integer is a multiple of both 5 and 7

```
number = int(input("Enter an integer: "))  
if((number%5==0)and(number%7==0)):  
    print(number, "is a multiple of both 5 and 7")  
else:  
    print(number, "is not a multiple of both 5 and 7")
```

While Loop

Python program to check whether the given integer is a prime number or not

```
num = int(input("Enter a number ( greater than 1)"))  
f = 0  
i = 2  
while i <= num / 2:  
    if num % i == 0:  
        f=1  
        break  
    i=i+1  
  
if f==0:  
    print("The entered number is a PRIME number")  
else:  
    print("The entered number is not a PRIME number")
```

Python program to find the average of 10 numbers using while loop

```
count = 0
sum = 0.0
while(count<10):
    number = float(input("Enter a real number: "))
    count=count+1
    sum = sum+number
avg = sum/10;
print("Average is :",avg)
```

Write a program to print n natural number in descending order using a while loop.

```
# N natural number
n = int(input("Enter range: ")) #10
while(n!=0):
    print(n, end=" ")
    n = n - 1

# output
# 10 9 8 7 6 5 4 3 2 1
```

Python program to find the area of a triangle whose sides are given

```
import math
a = float(input("Enter the length of side a: "))
b = float(input("Enter the length of side b: "))
c = float(input("Enter the length of side c: "))
s = (a+b+c)/2
area = math.sqrt(s*(s-a)*(s-b)*(s-c))
print(" Area of the triangle is: ", area)
```

Python program to find the circumference and area of a circle with a given radius

```
import math
r = float(input("Input the radius of the circle: "))
c = 2 * math.pi * r
area = math.pi * r * r
print("The circumference of the circle is: ", c)
print("The area of the circle is: ", area)
```

Python program to display the given integer in reverse manner

```
number = int(input("Enter a positive integer: "))

rev = 0

while(number!=0):

    digit = number%10

    rev = (rev*10)+digit

    number = number//10

print(rev)
```

Python program to find the sum of the digits of an integer using while loop

```
sum = 0

number = int(input("Enter an integer: "))

while(number!=0):

    digit = number%10

    sum = sum+digit

    number = number//10

print("Sum of digits is: ", sum)
```

Python program to check leap year

```
year = int(input("Enter a year: "))

if (year % 4) == 0:
    if (year % 100) == 0:
        if (year % 400) == 0:
            print(year, " is a leap year")
        else:
            print(year, " is not a leap year")
    else:
        print(year, " is a leap year")
else:
    print(year, " is not a leap year")
```

#Python program to generate Fibonacci series until 'n' value

```
n = int(input("Enter the value of 'n': "))
a = 0
b = 1
sum = 0
count = 1
print("Fibonacci Series : ", end = " ")
while(count <= n):
    print(sum, end = " ")
    count += 1
    a = b
    b = sum
    sum = a + b
```

Finding the sum of even numbers using while loop

```
i = 0
sum = 0
n = int(input("Enter the number n: "))

while i <= n:
    if i % 2 == 0:
        sum += i
    i += 1
```

Finding the factorial of a given number using while loop

```
print("Sum of even numbers till n:",sum)
n = int(input("Enter the number: "))
f = n
r = 1

while f != 0 :
    r *= f
    f -= 1
print("Factorial of",n,"is:",r)
```

Finding the multiples of a number using while loop

```
n = int(input("Enter an integer: "))
i = 1
while i <= 10:
    mul = i*n
    i += 1
    print(mul)
```

For Loop

Python program to find out the average of a set of integers

```
count = int(input("Enter the count of numbers: "))
i = 0
sum = 0
for i in range(count):
    x = int(input("Enter an integer: "))
    sum = sum + x
avg = sum/count
print(" The average is: ", avg)
```

Write a program to count the occurrence of even number and odd number between the range 10 – 55.

```
num1 = int(input("Enter starting range: "))
num2 = int(input("Enter ending range: "))
eve_count = 0
odd_count = 0
for i in range(num1, num2):
    if i%2 == 0:
        eve_count += 1
    else:
        odd_count += 1
print(f"Even number counts is {eve_count}")
print(f"Odd number counts is {odd_count}")
```

Python program to find the product of a set of real numbers

```
i = 0
product = 1
count = int(input("Enter the number of real numbers: "))
for i in range(count):
    x = float(input("Enter a real number: "))
    product = product * x
print("The product of the numbers is: ", product)
```

Python program to display all the multiples of 3 within the range 10 to 50

```
for i in range(10,50):
    if (i%3==0):
        print(i)
```

Python program to display all integers within the range 100-200 whose sum of digits is an even number

```
for i in range(100,200):
    num = i
    sum = 0
    while(num!=0):
        digit = num%10
        sum = sum + digit
        num = num//10
    if(sum%2==0):
        print(i)
```


Python program to generate the prime numbers from 1 to N

```
num =int(input("Enter the range: "))
for n in range(2,num):
    for i in range(2,n):
        if(n%i==0):
            break
    else:
        print(n)
```

Python program to find the roots of a quadratic equation

```
import math
a = float(input("Enter the first coefficient: "))
b = float(input("Enter the second coefficient: "))
c = float(input("Enter the third coefficient: "))
if (a!=0.0):
    d = (b*b)-(4*a*c)
    if (d==0.0):
        print("The roots are real and equal.")
        r = -b/(2*a)
        print("The roots are ", r,"and", r)
    elif(d>0.0):
        print("The roots are real and distinct.")
        r1 = (-b+(math.sqrt(d)))/(2*a)
        r2 = (-b-(math.sqrt(d)))/(2*a)
        print("The root1 is: ", r1)
        print("The root2 is: ", r2)
    else:
        print("The roots are imaginary.")
        rp = -b/(2*a)
        ip = math.sqrt(-d)/(2*a)
        print("The root1 is: ", rp, "+ i",ip)
        print("The root2 is: ", rp, "- i",ip)
else:
    print("Not a quadratic equation.")
```

Write a program to display the first 7 multiples of 7.

```
# First 7 numbers multiple of 7
```

```
count = 0
```

```
for i in range(200):
```

```
    if i%7 == 0:
```

```
        print(i,end=" ")
```

```
        count = count+1
```

```
        if count == 8:
```

```
            break
```

```
# output
```

```
# 0 7 14 21 28 35 42 49
```

Write a program that appends the square of each number to a new list.

```
#Appending square to a new list
```

```
x = [2,3,4,5,6,7,8]
```

```
z = []
```

```
for i in range(len(x)):
```

```
    z.append(x[i]**2)
```

```
print("Result: ",z)
```

```
# output
```

```
# Result: [4, 9, 16, 25, 36, 49, 64]
```

WAP to separate positive and negative number from a list.

```
# Program to separate +ve and -ve
x = [23,4,-6,23,-9,21,3,-45,-8]
pos = []
neg = []
for i in range(len(x)):
    if x[i] < 0:
        neg.append(x[i])
    else:
        pos.append(x[i])
print("Positive numbers are: ",pos)
print("Negative numbers are: ",neg)
```

```
# output
# Positive numbers are: [23, 4, 23, 21, 3]
# Negative numbers are: [-6, -9, -45, -8]
```

Python program to check if a number is odd or even.

```
for i in list_of_numbers:

    # check if no. is odd
    if i%2!=0:

        # if condition is True print "odd"
        print(i,"is an odd number")

    # check if no. is even
    if i%2==0:

        # if condition is false print "even"
        print(i,"is an even number")
```

Output:

```
2 is an even number
4 is an even number
6 is an even number
9 is an odd number
5 is an odd number
```

Python program to check if a number is odd and divisible by 3.

```
list_of_numbers = [4,5,9,17,21]
```

```
# for loop to iterate through
```

```
# the list and check each
```

```
# element of the list
```

```
for i in list_of_numbers:
```

```
    # condition1: check if no. is odd
```

```
    # if yes execute the code block inside
```

```
    # the first if statement
```

```
    if i%2!=0:
```

```
        # condition2: check if no. is
```

```
        # also divisible by 3.
```

```
        if i%3==0:
```

```
            # if condition2 is true
```

```
            # execute the below code block
```

```
            print (i,"is an odd number & divisible by 3")
```

```
        # if condition2 is False
```

```
        # execute the below code block
```

```
    else:
```

```
        print (i, "is an odd number but not divisible by 3")
```

```
# if condition1 is False
```

```
# execute the below code block
```

```
else:
```

```
    print(i,"is an even number")
```

Output:

4 **is** an even number

5 **is** an odd number but **not** divisible by 3

9 **is** an odd number & divisible by 3

17 **is** an odd number but **not** divisible by 3

21 **is** an odd number & divisible by 3

Print First 10 natural numbers using while loop

program 1: Print first 10 natural numbers

```
i = 1
```

```
while i <= 10:
```

```
    print(i)
```

```
    i += 1
```

Calculate the sum of all numbers from 1 to a given number

s: store sum of all numbers

```
s = 0
```

```
n = int(input("Enter number "))
```

run loop n times

stop: n+1 (because range never include stop number in result)

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

```
    # add current number to sum variable
```

```
    s += i
```

```
print("\n")
```

```
print("Sum is: ", s)
```

Write a program to print multiplication table of a given number

```
n = 2
```

stop: 11 (because range never include stop number in result)

run loop 10 times

```
for i in range(1, 11, 1):
```

```
    # 2 *i (current number)
```

```
    product = n * i
```

```
    print(product)
```

Display numbers from a list using loop

```
numbers = [12, 75, 150, 180, 145, 525, 50]
```

```
# iterate each item of a list
```

```
for item in numbers:
```

```
    if item > 500:
```

```
        break
```

```
    elif item > 150:
```

```
        continue
```

```
    # check if number is divisible by 5
```

```
    elif item % 5 == 0:
```

```
        print(item)
```

Count the total number of digits in a number

```
num = 75869
```

```
count = 0
```

```
while num != 0:
```

```
    # floor division
```

```
    # to reduce the last digit from number
```

```
    num = num // 10
```

```
    # increment counter by 1
```

```
    count = count + 1
```

```
print("Total digits are:", count)
```

Display numbers from -10 to -1 using for loop

```
for num in range(-10, 0, 1):
```

```
    print(num)
```

Write a program to display all prime numbers within a range

start = 25

end = 50

print("Prime numbers between", start, "and", end, "are:")

for num **in** **range**(start, end + 1):

 # all prime numbers are greater than 1

 # if number is less than or equal to 1, it is not prime

if num > 1:

for i **in** **range**(2, num):

 # check for factors

if (num % i) == 0:

 # not a prime number so break inner loop and

 # look for next number

break

else:

print(num)

Display Fibonacci series up to 10 terms

first two numbers

num1, num2 = 0, 1

print("Fibonacci sequence:")

run loop 10 times

for i **in** **range**(10):

 # print next number of a series

print(num1, end=" ")

 # add last two numbers to get next number

 res = num1 + num2

 # update values

 num1 = num2

 num2 = res

Find the factorial of a given number

```
num = 5
```

```
factorial = 1
```

```
if num < 0:
```

```
    print("Factorial does not exist for negative numbers")
```

```
elif num == 0:
```

```
    print("The factorial of 0 is 1")
```

```
else:
```

```
    # run loop 5 times
```

```
    for i in range(1, num + 1):
```

```
        # multiply factorial by current number
```

```
        factorial = factorial * i
```

```
    print("The factorial of", num, "is", factorial)
```

Reverse a given integer number

```
num = 76542
```

```
reverse_number = 0
```

```
print("Given Number ", num)
```

```
while num > 0:
```

```
    reminder = num % 10
```

```
    reverse_number = (reverse_number * 10) + reminder
```

```
    num = num // 10
```

```
print("Revere Number ", reverse_number)
```

Calculate the cube of all numbers from 1 to a given number

```
t_number = 6
```

```
for i in range(1, input_number + 1):
```

```
    print("Current Number is :", i, " and the cube is", (i * i * i))
```


Find the sum of the series upto n terms

$$2 + 22 + 222 + 2222 + 22222 = 24690$$

n = 5

first number of sequence

start = 2

sum_seq = 0

run loop n times

for i **in** range(0, n):

print(start, end="+")

 sum_seq += start

 # calculate the next term

 start = start * 10 + 2

print("\\nSum of above series is:", sum_seq)

Functions

Define a function that accepts 2 values and return its sum, subtraction and multiplication.

```
def result(a, b):  
    sum = a+b  
    sub = a-b  
    mul = a*b  
    print(f"Sum is {sum}, Sub is {sub}, & Multiply is {mul}")
```

```
a = int(input("Enter value of a: ")) # 7  
b = int(input("Enter value of b: ")) # 5  
result(a,b)
```

Define a function that accepts roll number and returns whether the student is present or absent.

```
def detail(roll):  
    x = [23,43,22,56]  
    if roll in x:  
        print(f"Roll number {roll} is present")  
    else:  
        print(f"Roll number {roll} is absent")  
roll = int(input("Enter roll no. ")) # 24  
detail(roll)
```

output

Roll number 24 is absent

Define a function that returns Factorial of a number.

```
def factorial(num):  
    fact = 1  
    while(num!=0):  
        fact *= num  
        num = num - 1  
    print("Factorial is",fact)  
  
num = int(input("Enter number "))  
factorial(num)
```

Define a function that accepts radius and returns the area of a circle.

```
def area(radius):  
    area = 3.14*radius*radius  
    return area  
  
radius = int(input("Enter Radius: ")) # 4  
print(area(radius))
```

Python program to implement a calculator to do basic operations

```
def add(x,y):
    print(x+y)
def subtract(x,y):
    print(x-y)
def multiply(x,y):
    print(x*y)
def divide(x,y):
    print(x/y)
print("Enter two numbers")
n1=input()
n2=input()
print("Enter the operation +,-,/, ")
op=input()
if op=='+':
    add(int(n1),int(n2))
elif op=='-':
    subtract(int(n1),int(n2))
elif op=='*':
    multiply(int(n1),int(n2))
elif op=='/':
    divide(int(n1),int(n2))
else:
    print(" Invalid entry ")
```

OR

Program make a simple calculator

This function adds two numbers

```
def add(x, y):
    return x + y
```

This function subtracts two numbers

```
def subtract(x, y):
    return x - y
```

This function multiplies two numbers

```
def multiply(x, y):
```

```
return x * y
```

```
# This function divides two numbers
```

```
def divide(x, y):  
    return x / y
```

```
print("Select operation.")  
print("1.Add")  
print("2.Subtract")  
print("3.Multiply")  
print("4.Divide")
```

```
while True:
```

```
    # take input from the user  
    choice = input("Enter choice(1/2/3/4): ")
```

```
    # check if choice is one of the four options
```

```
    if choice in ('1', '2', '3', '4'):  
        num1 = float(input("Enter first number: "))  
        num2 = float(input("Enter second number: "))
```

```
        if choice == '1':  
            print(num1, "+", num2, "=", add(num1, num2))
```

```
        elif choice == '2':  
            print(num1, "-", num2, "=", subtract(num1, num2))
```

```
        elif choice == '3':  
            print(num1, "*", num2, "=", multiply(num1, num2))
```

```
        elif choice == '4':  
            print(num1, "/", num2, "=", divide(num1, num2))
```

```
    # check if user wants another calculation
```

```
    # break the while loop if answer is no
```

```
    next_calculation = input("Let's do next calculation? (yes/no): ")  
    if next_calculation == "no":  
        break
```

```
else:
```

```
    print("Invalid Input")
```

[1] The given number is odd or even.

```
def odd_even():  
    n = int(input("Enter any number:"))  
    if n % 2!=0:  
        print("No is odd")  
    else:  
        print("No is even")  
odd_even()
```

[2] The given number is positive or negative or zero.

```
def pnz_check():  
    n = int(input("Enter any number:"))  
    if n>0:  
        print("No is positive")  
    elif n<0:  
        print("No is negative")  
    else:  
        print("Zero")  
pnz_check()
```

[3] The given number is of one digit or two digit or three digit or more than three digit.

```
def dig_check():  
    n = int(input("Enter any number:"))  
    if n>0 and n<10:  
        print("One digit number")  
    elif n>10 and n<100:  
        print("Two digit number")  
    elif n>100 and n<1000:  
        print("Three digit number")  
    else:  
        print("More than three digit number")  
dig_check()
```

[4] The entered number is smallest 4 digit number or not.

```
def smallest4digit():  
    n = int(input("Enter any number:"))  
    if n==1000:  
        print("n is smallest 4 digit no")  
    else:  
        print("n is not a smallest 4 digit no")  
smallest4digit()
```

[5] The given character is an uppercase letter or lowercase letter or a digit or a special character.

```
def check_chr():  
    ch = input("Enter a character to check:")  
    if ord(ch)>=65 and ord(ch)<=90:  
        print("The character", ch, " is an uppercase letter")  
    elif ord(ch)>=97 and ord(ch)<=122:  
        print("The character", ch, " is a lowercase letter")  
    elif ord(ch)>=48 and ord(ch)<=57:  
        print("The character", ch, " is a digit")  
    else:  
        print("The character", ch, " is a special character")  
check_chr()
```

[6] The given year is a leap year or not.

```
def check_leapyear():  
    year = int(input("Enter a character to check:"))  
    if (year%4==0 and year%100!=0) or (year%400==0):  
        print("Year is a leap year")  
    else:  
        print("Year is not a leap year")  
check_leapyear()
```

[7] The given number is divisible by 5 or not.

```
def check_div5():
    n = int(input("Enter a number to check:"))
    if n%5==0:
        print("No is divisible by 5")
    else:
        print("No is not divisible by 5")
check_div5()
```

[8] Find maximum number out of given three numbers.

```
def check_max3():
    n1,n2,n3 = int(input("Enter no1:")),int(input("Enter
no2:")),int(input("Enter no3:"))
    if n1>n2 and n1>n3:
        print("No1 is maximum")
    elif n2>n1 and n2>n3:
        print("No2 is maximum")
    elif n3>n1 and n3>n2:
        print("No3 is maximum")
    else:
        print("All are equal")
check_max3()
```

[9] Write a program that reads three positive numbers a, b, c and determines whether they can form the three sides of a triangle.

```
def check_3tri():
    a=int(input("Enter no1:"))
    b=int(input("Enter no2:"))
    c=int(input("Enter no3:"))
    if(((a+b)<=c)or((b+c)<=a)or((c+a)<=b)):
        print("It can not form the triangle")
    else:
        print("It can form the triangle")
check_3tri()
```


[11] Whether the triangle will be an obtuse-angle, or a right-angle or an acute-angle triangle.

```
def check_tritype():
    a=int(input("Enter no1:"))
    b=int(input("Enter no2:"))
    c=int(input("Enter no3:"))
    square_a = a**2
    square_b = b**2
    square_c = c**2
    if square_a == square_a + square_b or square_b == square_a +
square_c or square_c == square_a + square_b:
        print("Right-angled Triangle")
    elif square_a > square_c + square_b or square_b > square_a +
square_c or square_c > square_a + square_b:
        print("Obtuse-angled Triangle")
    else:
        print("Acute-angled Triangle")
check_tritype()
```

[12] If the triangle is an acute angle triangle, determine further whether the triangle is equilateral, isosceles, or scalene.

```
def check_tritype2():
    a=int(input("Enter no1:"))
    b=int(input("Enter no2:"))
    c=int(input("Enter no3:"))
    if a==b==c:
        print("Equilateral triangle")
    elif a==b or b==c or c==a:
        print("isosceles triangle")
    else:
        print("Scalene triangle")
check_tritype2()
```

Real Time Applications

[1] A toy vendor supplies three types of toys: Battery Based Toys, Key-based Toys, and Electrical Charging Based Toys. The vendor gives a discount of 10% on orders for battery-based toys if the order is for more than Rs. 1000. On orders of more than Rs. 100 for key-based toys, a discount of 5% is given, and a discount of 10% is given on orders for electrical charging based toys of value more than Rs. 500. Assume that the numeric codes 1,2 and 3 are used for battery based toys, key-based toys, and electrical charging based toys respectively. Write a program that reads the product code and the order amount and prints out the net amount that the customer is required to pay after the discount.

```
def compute_discount():
    print("1. For Battery based Toys")
    print("2. For Key based Toys")
    print("3. Electric chargin based Toys")
    opt = int(input("Enter the product code (1,2 or 3)?:"))
    amt = int(input("Enter the amount:"))
    if opt==1:
        if amt>1000:
            dis = amt * 0.1
        else:
            dis = 0
    elif opt==2:
        if amt>100:
            dis = amt * 0.05
        else:
            dis=0
    elif opt==3:
        if amt>500:
            dis = amt*0.1
        else:
            dis = 0
    else:
        print("Product is not available")
    bill_amt= amt - dis
```

```
print("Customer has to pay:",bill_amt)
compute_discount()
```

[2] A function f is defined as follows :

$$\begin{aligned} f(x) &= ax^3 - bx^2 + cx - d, & \text{if } x > k \\ &= 0, & \text{if } x = k \\ &= -ax^3 + bx^2 - cx + d, & \text{if } x < k \end{aligned}$$

Write a program that reads a, b, c, d, k and x and prints the value of f(x).

```
def sol14():
    a = int(input("Enter a:"))
    b = int(input("Enter b:"))
    c = int(input("Enter c:"))
    d = int(input("Enter d:"))
    k = int(input("Enter k:"))
    x = int(input("Enter x:"))
    if x > k:
        fx = a*(x**3) - b*(x**2) + c*x - d
    if x == k:
        fx = 0
    if x < k:
        fx = -a*(x**3) + b*x**2 - c*x + d
    print(fx)
sol14()
```

[3] Write a program to do the following operations : CALCULATOR

- Read any two positive integer numbers (say n1 & n2) and one character type operator (say opr). Note that opr is any mathematical operator.
- Depending upon the operator, do the appropriate operation.

e. g. if opr is '+' then the display the value obtained by evaluating the expression (n1 + n2).

```
def sol15():  
    n1 = int(input("Enter n1:"))  
    n2 = int(input("Enter n2:"))  
    print("+ for addition\n")  
    print("- for addition\n")  
    print("* for addition\n")  
    print("/ for division\n")  
    ch = input("Enter the choice:")  
    if ch=='+':  
        ans = n1 + n2  
    elif ch == '-':  
        ans = n1 - n2  
    elif ch == '*':  
        ans = n1 * n2  
    elif ch == '/':  
        ans = n1 / n2  
    else:  
        print("Invalid choice")  
    print("The answer is:",ans)  
sol15()
```

[4] T4he Paschim Gujarat Vij Company Ltd. computes the electricity bill based on the following matrix:

Units Consumed	Charges
0-100	0.50 per unit
101-200	Rs. 50 plus Rs. 1 per unit over 100 units
201-300	Rs. 150 plus 1.50 per unit over 200 units
> 300	Rs. 300 plus Rs.2 per unit over 300 units

- 1. Ask user to enter the Past meter reading and current meter reading.**
- 2. Find the units consumed.**
- 3. Compute the bill according to given matrix.**

```
def sol16():  
    pmr = int(input("Enter past meter reading:"))  
    cmr = int(input("Enter current meter reading:"))  
    uc = cmr - pmr  
    if uc>0 and uc<=100:  
        bill_amt = uc * 0.50  
    elif uc>100 and uc<=200:  
        bill_amt = 50 + (uc-100) * 1  
    elif uc>200 and uc<=300:  
        bill_amt = 150 + (uc-200) * 1.50  
    else:  
        bill_amt = 300 + (uc-300) * 2  
    print("The bill amount is:",bill_amt)  
sol16()
```

[5] A cloth showroom has announced the following discounts on the purchase of specific items :

Amount	Shorts	Pants	Shits/T-Shirts
0-100	–	3%	5%
101-200	5%	8%	10%
201-300	10%	12%	15%
Above 300	18%	20%	22%

- 1. Ask user to enter the amount and assign following code for the items such as sh for shorts, p for pans and sht for shirts/t-shirts.**
- 2. Compute the discount and net amount paid by customer.**

```
def sol17():  
    print("/sh/ for Short")  
    print("/p/ for Pants")  
    print("/t/ for t-shirts")  
    opt = input("Enter the product code (/sh/,/p/,/sht/)?:")  
    amt = int(input("Enter the amount:"))  
    if opt=='s' or opt=='S':  
        if amt>0 and amt<100:  
            dis = 0  
        elif amt>100 and amt<200:  
            dis = amt * 0.05  
        elif amt>201 and amt<300:  
            dis = amt * 0.1  
        else:  
            dis = amt * 0.18  
    elif opt=='p' or opt=='P':  
        if amt>0 and amt<100:  
            dis = amt * 0.03  
        elif amt>100 and amt<200:  
            dis = amt * 0.08  
        elif amt>201 and amt<300:
```

```
        dis = amt * 0.12
    else:
        dis = amt * 0.20
    if opt=='t' or opt=='T':
        if amt>0 and amt<100:
            dis = amt * 0.05
        elif amt>100 and amt<200:
            dis = amt * 0.10
        elif amt>200 and amt<300:
            dis = amt * 0.15
        else:
            dis = amt * 0.22
    bill_amt = amt - dis
    print("Customer has to pay:",bill_amt)
sol17()
```

[6] BSNL has three categories of customers: Industrial, Bulk Institutional and Domestic. The rates for these are tabulated below :

Category	Units	Rate
Commercial	Minimum up to 5000 units	Rs. 1500
	Next 5000 units	Rs. 0.25 per unit
	Next 10000 units	Rs. 0.23 per unit
	Above this	Rs. 0.20 per unit
Institutional	Minimum up to 5000 units	Rs. 1800
	Next 5000 units	Rs. 0.30 per unit
	Next 10000 units	Rs. 0.28 per unit
	Above this	Rs. 0.25 per unit
Domestic	Minimum up to 100 Units	Rs. 75
	Next 100 Units	Rs. 1.25 per unit
	Next 200 Units	Rs. 2.00 per unit
	Above this	Rs. 2.50 per unit

1. Ask user to enter customer category, Units.
2. Compute the bill as per given criteria.
3. Print bill in proper format.

```
def sol18():  
    cat = input("Enter the category(commerical, institutional, or domestic:")  
    units =int( input("Enter the units:"))  
    if cat == "commercial":  
        if units>0 and units<=5000:  
            bill = 1500
```



```
elif units>5000 and units<=10000:
    bill = units * 0.25
elif units>10000 and units<=15000:
    bill = units * 0.23
elif units>15000:
    bill = units * 0.20
elif cat == "institutional":
    if units>0 and units<=5000:
        bill = 1800
    elif units>5000 and units<=10000:
        bill = units * 0.30
    elif units>10000 and units<=15000:
        bill = units * 0.28
    elif units>15000:
        bill = units * 0.25
if cat == "domestic":
    if units>0 and units<=100:
        bill = 75
    elif units>100 and units<=200:
        bill = units * 1.25
    elif units>200 and units<=300:
        bill = units * 2
    elif units>300:
        bill = units * 2.50
print("****80)
print("The category:",cat)
print("Units:", units)
print("****80)
print("Bill amount:", bill)
sol18()
```

[7] A transport company charges the fare according to following table:

Distance	Charges
1-50	8 Rs./Km
51-100	10 Rs./Km
> 100	12 Rs/Km

Ask user to enter the distance and compute the fare.

```
def sol19():  
    distance = int(input("Enter distance:"))  
    if distance>=1 and distance<=50:  
        fare = distance * 8  
    elif distance>=51 and distance<=100:  
        fare = distance * 10  
    elif distance>100:  
        fare = distance * 12  
    else:  
        print("Invalid fare")  
    print("The total fare is:",fare)  
sol19()
```

[8] The Sardar Patel Cricket Stadium, Motera has the following rates for different types of seats:

- 1. Ordinary – 2500**
- 2. Pavillion – 3500**
- 3. Upper Pavillion – 4500**
- 4. Commentary Box – 6000**
- 5. VIP – 8000**

They are giving 10% discount for online booking and 8% discount for advance booking and no discount is given for booking on match day from ticket window.

- 1. Ask user to enter the booking type like online, advance or window booking.**
- 2. Ask user to select the types of seats.**
- 3. Compute the amount and print the ticket with proper format.**

def sol20():

```
    b_type = input("Enter booking type(online or advanced or window):")
    s_type = input("Enter seat type(ordinary,pavillion,upper pavillion,
commentary box,VIP):")
    nop = int(input("Enter no. of persons:"))
    if s_type=="ordinary":
        rate = 2500
    elif s_type=="pavillion":
        rate = 3500
    elif s_type=="upper pavillion":
        rate = 4500
    elif s_type=="commentary box":
        rate = 6000
    elif s_type=="VIP":
        rate = 8000
    else:
        print("Invalid Seat Types")
    amt = nop * rate
    if b_type=="online":
        dis_per = "10%"
        dis = amt * 0.1
    elif b_type=="advanced":
        dis_per = "8%"
        dis = amt * 0.08
```

```
elif b_type=="window":
    dis_per = "0%"
    dis = 0
net_amt = amt - dis
print("-"*120)
print("\t\t\tSardar Patel Cricket Stadium - Motera, Ahmedabad")
print("-"*120)
print("Your Seats:",s_type,"\t Booking type:",b_type)
print("No of seats:",nop,"\t Amount (before discount):", amt)
print("-"*120)
print("Discount in (%):",dis_per,"\t Discount amount:",dis)
print("Bill amount is", net_amt)
sol20()
```