P E S University

Department of Computer Science & Engineering

Session : Aug-Dec 2019

Introduction to Computing using Python Laboratory(UE19CS102)

Week 5 – Programs on Control Structures.

1

Find roots of a quadratic equation - ax^2 + bx + c. What if
a = 0,
b*b - 4ac >= 0,
b*b - 4ac < 0
(roots are real & distinct, roots are real & equal, roots are imaginary)

Solution:

```
import math
Print(“enter  3 coefficients”)
a=float( input("Enter 1st coefficients")
b=float( input("Enter 2nd coefficients")
c=float( input("Enter 3rd coefficients")

determinant = b*b-4*a*c

#condition for real and different roots

if (determinant > 0):
        root1 = (-b + math.sqrt(determinant))/(2*a)
        root2 = (-b - math.sqrt(determinant))/(2*a)

        print("root1 = ", root1, " and "," root2 = ", root2)
        print("Real and distinct roots")

#condition for real and equal roots
elif (determinant == 0):
        root1 = root2 = -b/(2*a);
        print("root1 = ", root1, " and "," root2 = ", root2)
        print("Real and equal roots")

#if roots are not real
else:
        realPart = -b/(2*a);
        imaginaryPart = math.sqrt(-determinant)/(2*a);
        print("root1 = ",realPart ," + ", imaginaryPart, " and root2 = ",realPart, " -
",imaginaryPart)
        print("imaginary roots")
```

2)

Check whether a given date is valid. if yes, find the next date. Consider leap year as well.

	Solution:
	
	date=input("Enter the date in this format dd/mm/yyyy: ")
	dd,mm,yy=date.split('/')
	dd=int(dd)
	mm=int(mm)
	yy=int(yy)
	if(mm==1 or mm==3 or mm==5 or mm==7 or mm==8 or mm==10 or
	mm==12):
	max1=31
	elif(mm==4 or mm==6 or mm==9 or mm==11):
	max1=30
	elif(yy%4==0 and yy%100!=0 or yy%400==0):
	max1=29
	else:
	max1=28
	if(mm<1 or mm>12):
	print("Date is invalid.")
	elif(dd<1 or dd>max1):
	print("Date is invalid.")
	elif(dd==max1 and mm!=12):
	dd=1
	mm=mm+1
	print("Date is valid & next date is: ",dd,mm,yy)
	elif(dd==31 and mm==12):
	dd=1
	mm=1
	yy=yy+1
	print("Date is valid & next date is: ",dd,mm,yy)
	else:
	dd=dd+1
	print("Date is valid & next date is:",dd,mm,yy)

3)	Write a program to Check a triangle is equilateral, isosceles or scalene.
	
	Solution:
	
	print("Input lengths of the triangle sides: ")
	x = int(input("x: "))
	y = int(input("y: "))
	z = int(input("z: "))
	
	if x == y == z:
	print("Equilateral triangle")
	elif x==y or y==z or z==x:
	print("isosceles triangle")
	else:
	print("Scalene triangle")

4)	Write a program to find: a) Whether a given number is even or odd. b) whether the entered character is vowel or not.

c) Write a program that reads in three integer values from the user, and displays “Numbers Unique” if each of the values are different, otherwise displays “Duplicate Values Found.”

Solution:

a)

```
num = int(input("Enter a number: "))

if num%2==0:
   print("This is an even number.")
else:
   print("This is an odd number.")
```

b)

```
char=input("enter a single character")
all_vowels = 'aeiou'
if char in all_vowels:
        print("its a vowel")
else:
        print("not a vowel")
```

c)

```
num1 = int(input('Enter first number: '))
num2 = int(input('Enter second number: '))
num3 = int(input('Enter thrid number: '))

if (num1 != num2 and num2 != num3 and num1 != num3):
        print('Numbers Unique')
else:
        print('Duplicate Values Found')
```

5) Write a program to find the sum and product from 1 to n (included) ,where n is given by the user.

Sample:
if n=4: then sum would be 10 and product would be 24.

Solution:

```
n=int(input("enter the number"))
i=1;
prod=1
sum=0
while(i<=n):
        sum=sum+i
        prod=prod*i
        i=i+1
print("sum of",n,"numbers is=",sum)
print("Product of",n,"numbers is=",prod)
```

Consider 1-4 for execution. 5 is optional.