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| **Ex. 3** | **EXPLORING CONDITIONAL STATEMENTS** |
| **Date: 05/02/24** | |
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**Aim:**

To explore the use of conditional statements in Python by writing programs for the following and executing them:

1. Create a simple calculator that accepts two numbers and an arithmetic operator as inputs and performs the appropriate operation on the given numbers and displays the result.
2. Get a year from the user and check if it is a leap year and display the result.
3. Find the maximum of three numbers, obtained from the user, using conditional statements.
4. Obtain the marks secured by a student in Maths, Physics, Chemistry, Computer Science, and English, out of 100, and calculate their average. Check the range within which the average mark falls and display the appropriate grade. (A+ grade - 90 to 100, A grade - 80 to 90, B+ grade - 70 to 80, B grade - 60 to 70, C grade - 50 to 60, D grade - 40 to 50, F grade - less than 40)
5. identify if a point (x,y) lies inside, outside, or on the circumference of a circle of radius "r", centered at the origin. Obtain the values of x, y, and r from the user.
6. Obtain the lengths of the 4 sides of a quadrilateral and the angles at each corner of the quadrilateral. Verify if the dimensions represent a valid quadrilateral and if so, check whether the dimensions represent a square, a rectangle, or neither.

**Algorithm:**

**(a)**

Step 1: Get the value of 2 integers from the user

Step 2: Get the mode of operation and perform it

Step 3: Compute the answer and display it

**(b)**

Step 1: Get the year from the user

Step 2: Check if it is a leap year using conditional statements

Step 3: Display the output

**(c)**

Step 1: Get 3 integers from the user

Step 2: Determine the largest value using conditional statements

Step 3: Display the output

**(d)**

Step 1: Get the marks from the user

Step 2: Find the average and check with conditions using elif statements

Step 3: Display the output

**(e)**

Step 1: Get the coordinates and radius from the user

Step 2: Compute the value of d

Step 3: Display the output

**(f)**

Step 1: Get the sides and angles of a quadrilateral from the user

Step 2: Check if it’s a square or rectangle

Step 3: Display the output

**Program:**

(a)

a=int(input("Enter the first integer:"))

b=int(input("Enter the second integer:"))

op=input("Enter the operation to perform:(sum,difference,product,quotient)")

if(op=="sum"):

    print("Sum:",a+b)

elif(op=="difference"):

    print("Difference:",a-b)

elif(op=="product"):

    print("Product:",a\*b)

elif(op=="quotient"):

    print("quotient:",a/b)

else:

    print("INVALID OPERATOR")

(b)

year=int(input("Enter the year:"))

if((year%4==0 and year%100!=0) or (year%400==0)):

    print("It\'s a leap year")

else:

    print("It\'s not a leap year")

(c)

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

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

c=int(input("Enter the value of c:"))

max=0

if a>=b:

    if a>c:

        max=a

    elif c>a:

        max=c

elif b>=a:

    if b>c:

        max=b

    elif c>b:

        max=c

print("The largest number is",max)

(d)

math=int(input("Enter marks scored in math:"))

phy=int(input("Enter marks scored in physics:"))

chem=int(input("Enter marks scored in chemistry:"))

cs=int(input("Enter marks scored in computer science:"))

eng=int(input("Enter marks scored in english:"))

avg=(math+phy+chem+cs+eng)/5

if 100>=avg>90:

    print("GRADE:A+")

elif 90>=avg>80:

    print("GRADE:A")

elif 80>=avg>70:

    print("GRADE:B")

elif 70>=avg>60:

    print("GRADE:B+")

elif 60>=avg>50:

    print("GRADE=C")

elif 50>=avg>=40:

    print("GRADE=D")

elif avg<40:

    print("GRADE:F")

(e)

import math

x=int(input("Enter the value of x coordinate:"))

y=int(input("Enter the value of y coordinate:"))

r=int(input("Enter the radius of the circle:"))

d=math.sqrt(x\*\*2)+math.sqrt(y\*\*2)

if d<r:

    print("The point lies inside the circle")

elif d>r:

    print("The point lies outside the circle")

elif d==r:

    print("The point lies on the circle")

(f)

print("Enter the dimensions of the quadrilateral:")

s1=int(input("Enter the length of side 1:"))

s2=int(input("Enter the length of side 2:"))

s3=int(input("Enter the lenght of side 3:"))

s4=int(input("Enter the lenght of side 4:"))

a1=int(input("Enter angle 1 in degrees:"))

a2=int(input("Enter angle 2 in degrees:"))

a3=int(input("Enter angle 3 in degrees:"))

a4=int(input("Enter angle 4 in degrees:"))

sum\_angles=a1+a2+a3+a4

sum\_sides=s1+s2+s3+s4

if sum\_angles==360:

    print("It\'s a valid quadrilateral")

    if((s1==s2 and s2==s3 and s3==s4 and s1==s4) and (a1==a2 and a2==a3 and a3==a4 and a4==90 and a1==a4)):

        print("It\'s a square")

    elif(((s1==s3 and s2==s4)or(s1==s2 and s3==s4)) and (a1==a2 and a2==a3 and a3==a4 and a4==90 and a1==a4)):

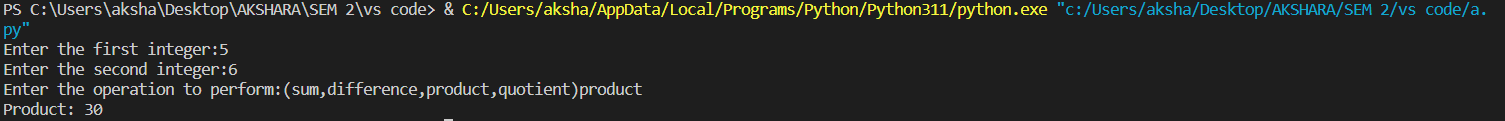
        print("It\'s a rectangle")

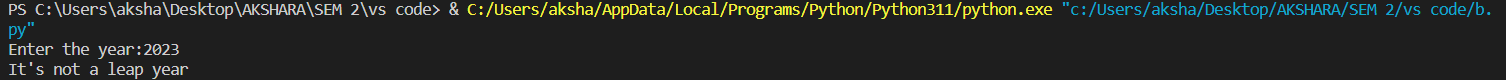
else:

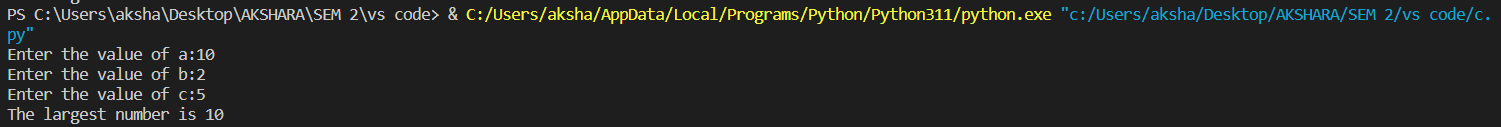
    print("It\'s not a quadrilateral")

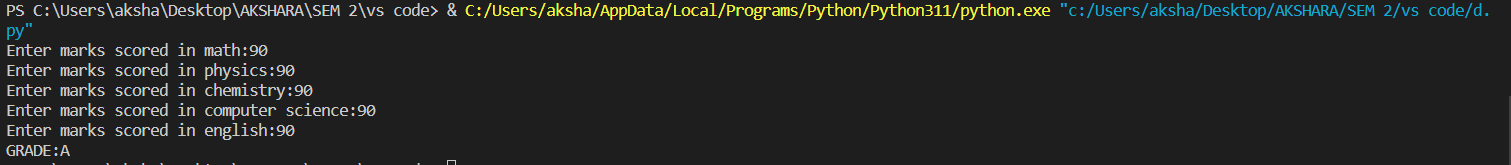
**Screenshot of Output:**

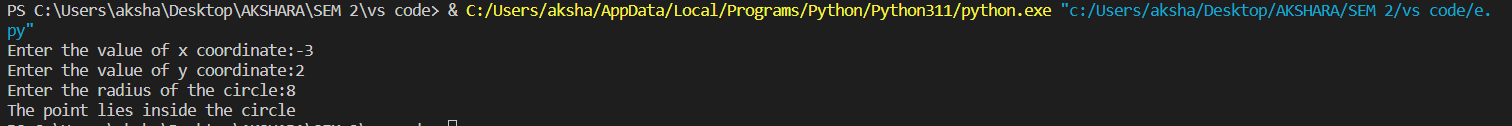
**(a)**

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**(b)**

**(c)**

**(d)**

**(e)**

**A black screen with yellow and green text

Description automatically generated(f)**

**Result:**

Thus, programs have been written and executed to explore the use of conditional statements in Python.