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Basics of Programming in Python

Branched Program Structures

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Example 14

Compose a program that prints a notification if an integer is entered:
a) even or odd;
b) positive, negative or equal to zero.

a) program code

```
1 #Zadatak 14a
2
3 broj=input("Unesite broj: ")
4 broj=int(broj)
5 if broj%2 == 0:
6     print("Broj je paran.")
7 else:
8     print("Broj je neparan.")
```

b) program code

```
1  #Zadatak 14b
2
3  broj=input("Unesite broj: ")
4  broj=int(broj)
5  if broj>0:
6      print("Broj je pozitivan.")
7  elif broj<0:
8      print("Broj je negativan.")
9  else:
10     print("Broj je jednak nuli.")
```

test program

```
Unesite broj: 5
Broj je neparan.
>>>
```

```
Unesite broj: 6
Broj je pozitivan.
>>>
```

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Example 15

Compose a program that, for two entered integers, prints the relationship between them (they are equal, the first one is greater than the second one, or the first one is less than the second one).

program code

```
1  #Zadatak 15
2
3  a=input("a= ")
4  b=input("b= ")
5  a=int(a)
6  b=int(b)
7  if (a==b):
8      print("Brojevi su jednaki.")
9  elif (a>b):
10     print("Broj",a,"je veci od broja",b,".")
11 else:
12     print("Broj",a,"je manji od broja",b,".")
```

test program

```
a= 5
b= 8
Broj 5 je manji od broja 8 .
>>>
```

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Example 16

Compose a program that, based on the entered number of points (from zero to 100), will print the corresponding grade (0-50 five, 51-60 six, 61-70 seven, 71-80 eight, 81-90 nine, 91-100 ten).

program code

```
1  #Zadatak 16
2
3  a=int(input("Unesite broj bodova: "))
4  if (a>90):
5      print("Ocena je 10.")
6  elif (a>80):
7      print("Ocena je 9.")
8  elif (a>70):
9      print("Ocena je 8.")
10 elif (a>60):
11     print("Ocena je 7.")
12 elif (a>50):
13     print("Ocena je 6.")
14 else:
15     print("Ocena je 5.")
```

test program

```
Unesite broj bodova: 92
Ocena je 10.
>>>
```

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Example 17

Compose a program for determining the signum function and printing the results to enter a real number x.

$$y = \operatorname{sgn}(x) = \begin{cases} -1 & , \ x<0 \\ 0 & , \ x=0 \\ 1 & , \ x>0 \end{cases}$$

program code

```
1  #Zadatak 17
2
3  x=float(input("x= "))
4  if(x==0):
5      y=0;
6  elif(x>0):
7      y=1
8  else:
9      y=-1
10 print("y =",y)
```

test program

```
x= 12.6
y = 1
>>>
==========
x= -3.6
y = -1
>>>
==========
x= 0
y = 0
>>>
```

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Example 18

Compose a program to calculate the function z for the input x and y.
The function z is defined as follows:

$$z == \begin{cases} 2x+3y & , \ -2 \le x \le 2 \\ \dfrac{x}{2x+y^3} & , \ 5 \le x < 10 \\ \sqrt{2x+3y^2} & , \ \text{ostalo} \end{cases}$$

program code

```
1  #Zadatak 18
2
3  import math
4  x=float(input("x= "))
5  y=float(input("y= "))
6  if(x>=-2)and(x<=2):
7      z=2*x+3*y
8  elif(x>=5)and(x<10):
9      z=x/(2*x+math.pow(y,3))
10 else:
11     z=math.sqrt(2*x+3*y*y)
12 z=round(z,4)
13 print("z =",z)
```

test program

```
x= 1
y= 3
z = 11.0
>>>
============
x= 6
y= 3
z = 0.1538
>>>
```

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Example 19

Compose a program to calculate the function z for the input x and y. The function z is defined as follows:

$$z = \begin{cases} \min(x, y), & y > 0 \\ \max(x^2, y^2), & y \le 0 \end{cases}$$

program code

```
1  #Zadatak 19a
2
3  x=float(input("x= "))
4  y=float(input("y= "))
5  if(y<=0):
6      if((x*x)<(y*y)): z=y*y
7      else: z=x*x
8  else:
9      if(x<y): z=x
10     else: z=y
11 print("z=",z)
```

```
1  #Zadatak 19b
2
3  import math
4  x=float(input("x= "))
5  y=float(input("y= "))
6  if(y<=0):
7      z=max(x*x,y*y)
8  else:
9      z=min(x,y)
10 print("z=",z)
```

test program

```
x= 5
y= -2
z= 25.0
>>>
==========
x= 5
y= 2
z= 2.0
>>>
```

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Example 20

Compose a program that prints a notification whether the entered variables a, b and c indicating the lengths of the sides form a triangle. If they form a triangle, calculate the area of the triangle using the following formulas: $S=\frac{a+b+c}{2}$ $P=\sqrt{S(S-a)(S-b)(S-c)}$

program code

```
1  #Zadatak 21
2
3  import math
4  print("Unesite stranice trougla:")
5  a=float(input("a= "))
6  b=float(input("b= "))
7  c=float(input("c= "))
8  if (a+b>c and a+c>b and b+c>a):
9      s=(a+b+c)/2
10     p=math.sqrt(s*(s-a)*(s-b)*(s-c))
11     p=round(p,3)
12     print("Stranice formiraju trougao povrsine p=", p)
13 else:
14     print("Stranice ne formiraju trougao.")
```

test program

```
Unesite stranice trougla:
a= 1
b= 2
c= 6
Stranice ne formiraju trougao.
>>>
============ RESTART: C:/Users/KORISNIK-/Desk
Unesite stranice trougla:
a= 4
b= 2
c= 3
Stranice formiraju trougao povrsine p= 2.905
```

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Questions & Answers

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