Basics of Programming in Python

Cyclic Program Structures: FOR Cycle

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Example 21

Compose a program that will print the sentence **Pozdrav svima!** using a FOR loop.

program code

```
1  #Zadatak 21
2
3  for i in range(1, 5+1):
4      print("Pozdrav svima!")
5
6  #ili
7  #for i in range(1, 6):
8  #for i in range(1, 6, 1):
```

test program

```
Pozdrav svima!
Pozdrav svima!
Pozdrav svima!
Pozdrav svima!
Pozdrav svima!
>>>
```

Example 22

Compose a program that, using a FOR loop, prints:

a) all numbers of the first ten,

b) only odd numbers of the first ten,

c) all numbers of the first ten in reverse order.

program code

a)
```
1 #Zadatak 22a
2
3 for i in range(1, 11, 1):
4     print("i=",i)
```

```
i= 1
i= 2
i= 3
i= 4
i= 5
i= 6
i= 7
i= 8
i= 9
i= 10
>>>
```

b)
```
1 #Zadatak 22b
2
3 for i in range(1, 11, 2):
4     print("i=",i)
```

```
i= 1
i= 3
i= 5
i= 7
i= 9
>>>
```

c)
```
1 #Zadatak 22c
2
3 for i in range(10, 0, -1):
4     print("i=",i)
```

```
i= 10
i= 9
i= 8
i= 7
i= 6
i= 5
i= 4
i= 3
i= 2
i= 1
>>>
```

Example 23

Compose a program that, for an entered n, prints the sum of the first n positive integers.

program code

```
1  #Zadatak 23
2
3  n=int(input("Unesite n= "))
4  s=0
5  for i in range(1, n+1, 1):
6      s=s+i
7  print("Suma=",s)
```

test program

```
Unesite n= 5
Suma= 15
>>>
```

Example 24

Compose a program that calculates the sum for the entered integer n: $S = 1! + 2! + 3! + \ldots + n!$

program code

```
1 #Zadatak 24
2
3 n=int(input("Unesite n= "))
4 s=0
5 f=1
6 for i in range(1, n+1, 1):
7     f=f*i
8     s=s+f
9 print("Suma=",s)
```

test program

```
Unesite n= 5
Suma= 153
>>>
```

Example 25

Compose a program that calculates the expression for the given natural numbers m and n:

$$S = \frac{1}{n+m} - \frac{1}{n+2m} + \frac{1}{n+3m} - \ldots (-1)^{m+1} \frac{1}{n+m \cdot m}$$

program code

```
1  #Zadatak 25
2
3  n=int(input("Unesite n= "))
4  m=int(input("Unesite m= "))
5  s=0
6  znak=1
7  for i in range(1, m+1, 1):
8      s=s+znak/(n+i*m)
9      znak=-znak
10 print("Suma=",round(s,5))
```

test program

```
Unesite n= 2
Unesite m= 3
Suma= 0.16591
>>>
```

Example 26

Compose a program that, for a given integer n and a real number h, calculates the expression: $S = \cos(x) + \cos(x^2) + \ldots + \cos(x^n)$

program code

```
1  #Zadatak 26
2
3  import math
4  n=int(input("Unesite n= "))
5  x=float(input("Unesite x= "))
6  s=0
7  p=1
8  for i in range(1, n+1, 1):
9      p=p*x
10     s=s+math.cos(p)
11 print("Suma=",round(s,5))
```

test program

```
Unesite n= 5
Unesite x= 1
Suma= 2.70151
>>>
========== REST
Unesite n= 5
Unesite x= 2
Suma= -1.33873
```

Example 27

Compose a program that will print all numbers in the range from a to b that are divisible by 7 and their sum.

program code

```
1  #Zadatak 27
2
3  a=int(input("Unesite a= "))
4  b=int(input("Unesite b= "))
5  s=0
6  print("Brojevi od",a,"do",b,"deljivi sa 7:")
7  for i in range(a, b+1, 1):
8      if (i%7==0):
9          s=s+i
10         print(i)
11 print("Suma=",s)
```

test program

```
Unesite a= 5
Unesite b= 35
Brojevi od 5 do 35 deljivi sa 7:
7
14
21
28
35
Suma= 105
>>>
```

Example 28

Compose a program that prints all three-digit Armstrong numbers. A three-digit number is an Armstrong number if it is equal to the sum of the cubes of its digits.

program code

test program

```
1 #Zadatak 28
2
3 print("Amstrongovi brojevi:")
4 for a in range(1, 9+1, 1):
5     for b in range(0, 9+1, 1):
6         for c in range(0, 9+1, 1):
7             broj=100*a+10*b+c
8             if (broj==a*a*a+b*b*b+c*c*c):
9                 print(broj)
```

```
Amstrongovi brojevi:
153
370
371
407
>>>
```

Example 29

Compose a program that prints all three-digit numbers where the second digit is 4 more than the first, and the third is 3 more than the second.

program code

```
1  #Zadatak 29
2
3  print("Brojevi:")
4  for a in range(1, 9+1, 1):
5      for b in range(0, 9+1, 1):
6          for c in range(0, 9+1, 1):
7              broj=100*a+10*b+c
8              if (b==a+4 and c==b+3):
9                  print(broj)
```

test program

```
Brojevi:
158
269
>>>
```

Questions & Answers