دانشگاه ملی مهارت

دانشکده فنی و حرفه‌ای انقلاب اسلامی

انستیتو برق و کامپیوتر

رشته تحصیلی:

مهندسی حرفه ای کنترل

عنوان:

تمرین کلاسی

استاد راهنما:

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نگارش:

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آبان 1403

دستور if:

- قدر مطلق

```
x = -10
if x < 0:
   x = -x
print(x)
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
10
```

- مرتب کردن اعداد به ترتیب

```
x = 10
y = 20
if x > y:
   temp = x
   x = y
   y = temp

print(temp)
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
10
```

- بیشترین مقدار بین دو عدد

```
x = 10
y = 20
if x > y:
   maximum = x
else:
   maximum = y
print(maximum)
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
20
```

- بررسی خطا برای عملیات باقی مانده

```
num= 439
y = 20
den = num % y
if den == 0:
   print('division by zero')
else:
   print('remainder =' + ' num % den ')
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
remainder = num % den
```

- بررسی خطا برای منفی شدن دلتا در عملیات

```
import math
a = 2
b = 4
c = 1
discriminant = b**2-4*a*c
if discriminant <0:
   print('no real roots')
else:
   d = math.sqrt(discriminant)
   print((-b + d) / 2.0)
   print((-b - d) / 2.0)
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
-0.5857864376269049
-3.414213562373095
```

- اهمیت دندانه گذاری در دستورات شرطی

```
x = -6
if x >=0:
   print('not' , end='')
print('negative')
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
Negative
```

- بدست آوردن توان های عدد دو

```
power = 1
n = 5
for i in range (n + 1):
   print(str(i) + '   ' + str(power))
   power *= 2
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
0   1
1   2
2   4
3   8
4   16
5   32
```

- بدست آوردن مجموع چند عدد

```
total = 0
n = 5
for i in range(1 , n + 1):
   total += i
print(total)
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
15
```

- بدست آوردن فاکتوریل (!)

```
product = 1
n=5
for i in range(1, n + 1):
    product *= i
print(product)
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
120
```

- بدست آوردن جدولی از مقادیر یک تابع

```
import math
n=5
for i in range(n + 1):
    print(str(i) + '    ' + str(2 * math.pi * i / n))
```

```
PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
0    0.0
1    1.2566370614359172
2    2.5132741228718345
3    3.7699111843077517
4    5.026548245743669
5    6.283185307179586
```

- بدست آوردن ریشه ی معادله به روش نیوتون-رافسون

```
def f(x):
    return x**2 - 2
def df(x):
    return 2*x
def newton_raphson (x0 , tol = 1e-10 , max_iter = 100):
    x_n = x0
    for n in range(max_iter):
        f_xn = f(x_n)
        df_xn = df(x_n)
        if df_xn == 0:
            print("")
            return None
        x_n1 = x_n - f_xn / df_xn
        if abs(x_n1 - x_n) < tol:
            return x_n1
        x_n = x_n1
    print("  , x_n")
    return x_n
initial_guess = 1.0
root = newton_raphson(initial_guess)
print("rishe:" , root)
```

PS C:\Users\Bashir-Rayaneh\Desktop\test> & C:/Users/Bashir-Rayaneh/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Bashir-Rayaneh/Desktop/test/test.py
rishe: 1.4142135623730951