

Programming in Python ML Bootcamp Assignment 01

31st July 2023

INSTRUCTIONS

This assignment covers Chapter 01 Variables and Data Types. Code should be typed in Jupyter Notebook. There must be a heading (using markdown) before the solution in each cell to show which part of the question you are answering as shown in the attached notebook (Yourname_Assignment01.ipynb). You should also attach a pdf file where you have captured the outputs after running the question solution. Filename should be the same as above BUT with extension pdf.

Important: DO NOT use following in answering questions: (i) control structures (if..elif..) (ii) while/for loops (iii) split function, (iv) lists, tuples and dictionaries (v) Numpy and pandas
Formatting of strings should use f-strings format.

Question 01

a)

```
In [1]: print("He said, \"John's program is easy to read\"")  
He said, "John's program is easy to read"
```

b)

```
In [2]: import math
```

b) i) test for 5.5 cm

```
In [3]: # Prompt the user to enter the length (r) in cm from the center of a pentagon to a vertex  
r = float(input("Enter the length from the center to a vertex (r) in cm: "))  
  
# Compute the side length (s) using the formula s = 2r * sin(pi / 5)  
s = 2 * r * math.sin(math.pi / 5)  
  
# Compute the area of the pentagon using the formula Area = (3 * sqrt(3) * s^2) / 2  
area = (3 * math.sqrt(3) * s**2) / 2  
  
# Compute the sum of angles in degrees (sum of interior angles in a pentagon is 540 degrees)  
sum_of_angles_degrees = math.degrees((3*math.pi / 5)*5)
```

```
# Display the results using f-strings
print(f"Length of each side (s) is: {s:.2f} cm")
print(f"The area of the pentagon is: {area:.2f} cm^2")
print(f"Sum of angles is {sum_of_angles_degrees:.1f} degrees")
```

Enter the length from the center to a vertex (r) in cm: 5.5
 Length of each side (s) is: 6.47 cm
 The area of the pentagon is: 108.61 cm^2
 Sum of angles is 540.0 degrees

b) ii) test for 13.45 cm

```
In [4]: # Prompt the user to enter the length (r) in cm from the center of a pentagon to a vertex
r = float(input("Enter the length from the center to a vertex (r) in cm: "))

# Compute the side length (s) using the formula s = 2r * sin(pi / 5)
s = 2 * r * math.sin(math.pi / 5)

# Compute the area of the pentagon using the formula Area = (3 * sqrt(3) * s^2) / 2
area = (3 * math.sqrt(3) * s**2) / 2

# Compute the sum of angles in degrees (sum of interior angles in a pentagon is 540 degrees)
sum_of_angles_degrees = math.degrees((3*math.pi / 5)*5)

# Display the results using f-strings
print(f"Length of each side (s) is: {s:.2f} cm")
print(f"The area of the pentagon is: {area:.2f} cm^2")
print(f"Sum of angles is {sum_of_angles_degrees:.1f} degrees")
```

Enter the length from the center to a vertex (r) in cm: 13.45
 Length of each side (s) is: 15.81 cm
 The area of the pentagon is: 649.52 cm^2
 Sum of angles is 540.0 degrees

c)

c) i) test for 3125

```
In [5]: # Prompt the user to enter a positive integer
num = input("Enter a positive integer: ")

# Reverse the number using string slicing
reversed_num = num[::-1]

# Display the reversed number
print("The number in reverse order is:", reversed_num)
```

Enter a positive integer: 3125
 The number in reverse order is: 5213

c) i) test for 648923

```
In [6]: # Prompt the user to enter a positive integer
num = input("Enter a positive integer: ")
```

```
# Reverse the number using string slicing
reversed_num = num[::-1]

# Display the reversed number
print("The number in reverse order is:", reversed_num)
```

Enter a positive integer: 648923

The number in reverse order is: 329846

Question 02

i)

```
In [7]: # Given value of str
str = 'Tumaini Hamis Kimario 2016-06-56789 M'
```

i) a)

```
In [8]: # Display the value of str
print("Value of str:", str)
```

Value of str: Tumaini Hamis Kimario 2016-06-56789 M

i) b)

```
In [9]: # indexing spaces
first_space_index = str.find(' ')
second_space_index = str.find(' ', first_space_index + 1)
third_space_index = str.find(' ', second_space_index + 1)
fourth_space_index = str.find(' ', third_space_index + 1)

# assigning values to particulars variables
firstname = str[:first_space_index]
middlename = str[first_space_index + 1:second_space_index]
surname = str[second_space_index + 1:third_space_index]
reg_no = str[third_space_index + 1:fourth_space_index]
sex = str[fourth_space_index + 1:]

# Display the particulars in the specified format
print("Firstname:", firstname.capitalize())
print("Middle name:", middlename.capitalize())
print("Surname:", surname.capitalize())
print("Reg. No.:", reg_no)
print("Sex:", sex.capitalize())
```

Firstname: Tumaini

Middle name: Hamis

Surname: Kimario

Reg. No.: 2016-06-56789

Sex: M

i) c)

```
In [10]: # Display the fullname starting with surname in capital letters followed by con
print("\nFullname is:")
full_name = firstname + " " + middlename + " " + surname
print(full_name)
```

Fullname is:
Tumaini Hamis Kimario

i) d)

```
In [11]: # Display whether the student is Male or Female
print("\nIs student Male?", sex.upper() == 'M')
print("Is student Female?", sex.upper() == 'F')
```

Is student Male? True
Is student Female? False

ii)

```
In [12]: str='Lyimo Lucy Kokushubira 2021-06-07868 F'
```

ii) a)

```
In [13]: # Display the value of str
print("Value of str:", str)
```

Value of str: Lyimo Lucy Kokushubira 2021-06-07868 F

ii) b)

```
In [14]: # indexing spaces
first_space_index = str.find(' ')
second_space_index = str.find(' ', first_space_index + 1)
third_space_index = str.find(' ', second_space_index + 1)
fourth_space_index = str.find(' ', third_space_index + 1)

# assigning values to particulars variables
firstname = str[:first_space_index]
middlename = str[first_space_index + 1:second_space_index]
surname = str[second_space_index + 1:third_space_index]
reg_no = str[third_space_index + 1:fourth_space_index]
sex = str[fourth_space_index + 1:]

# Display the particulars in the specified format
print("Firstname:", firstname.capitalize())
print("Middle name:", middlename.capitalize())
print("Surname:", surname.capitalize())
print("Reg. No.:", reg_no)
print("Sex:", sex.capitalize())
```

Firstname: Lyimo
Middle name: Lucy
Surname: Kokushubira
Reg. No.: 2021-06-07868
Sex: F

ii) c)

```
In [15]: # Display the fullname starting with surname in capital letters followed by con
print("\nFullname is:")
full_name = firstname + " " + middlename + " " + surname
print(full_name)
```

Fullname is:
Lyimo Lucy Kokushubira

ii) d)

```
In [16]: # Display whether the student is Male or Female
print("\nIs student Male?", sex.upper() == 'M')
print("Is student Female?", sex.upper() == 'F')
```

Is student Male? False
Is student Female? True

iii)

```
In [17]: str='baraka KImario GeORge 2021-06-09789 m'
```

iii) a)

```
In [18]: # Display the value of str
print("Value of str:", str)
```

Value of str: baraka KImario GeORge 2021-06-09789 m

iii) b)

```
In [19]: # indexing spaces
first_space_index = str.find(' ')
second_space_index = str.find(' ', first_space_index + 1)
third_space_index = str.find(' ', second_space_index + 1)
fourth_space_index = str.find(' ', third_space_index + 1)

# assigning values to particulars variables
firstname = str[:first_space_index]
middlename = str[first_space_index + 1:second_space_index]
surname = str[second_space_index + 1:third_space_index]
reg_no = str[third_space_index + 1:fourth_space_index]
sex = str[fourth_space_index + 1:]

# Display the particulars in the specified format
print("Firstname:", firstname.capitalize())
print("Middle name:", middlename.capitalize())
print("Surname:", surname.capitalize())
print("Reg. No.:", reg_no)
print("Sex:", sex.capitalize())
```

Firstname: Baraka
 Middle name: Kimario
 Surname: George
 Reg. No.: 2021-06-09789
 Sex: M

iii) c)

```
In [20]: # Display the fullname starting with surname in capital letters followed by con
print("\nFullname is:")
full_name = firstname + " " + middlename + " " + surname
print(full_name)
```

Fullname is:
 baraka KImario GeORge

iii) d)

```
In [21]: # Display whether the student is Male or Female
print("\nIs student Male?", sex.upper() == 'M')
print("Is student Female?", sex.upper() == 'F')
```

Is student Male? True
 Is student Female? False

iv)

```
In [22]: str='mwakanemeLE Jacqueline mmbaga 2021-06-56789 f'
```

iv) a)

```
In [23]: # Display the value of str
print("Value of str:", str)
```

Value of str: mwakanemeLE Jacqueline mmbaga 2021-06-56789 f

iv) b)

```
In [24]: # indexing spaces
first_space_index = str.find(' ')
second_space_index = str.find(' ', first_space_index + 1)
third_space_index = str.find(' ', second_space_index + 1)
fourth_space_index = str.find(' ', third_space_index + 1)

# assigning values to particulars variables
firstname = str[:first_space_index]
middlename = str[first_space_index + 1:second_space_index]
surname = str[second_space_index + 1:third_space_index]
reg_no = str[third_space_index + 1:fourth_space_index]
sex = str[fourth_space_index + 1:]

# Display the particulars in the specified format
print("Firstname:", firstname.capitalize())
print("Middle name:", middlename.capitalize())
print("Surname:", surname.capitalize())
```

```
print("Reg. No.:", reg_no)
print("Sex:", sex.capitalize())
```

Firstname: Mwakanemele
 Middle name: Jacqueline
 Surname: Mmbaga
 Reg. No.: 2021-06-56789
 Sex: F

iv) c)

```
In [25]: # Display the fullname starting with surname in capital letters followed by con
print("\nFullname is:")
full_name = firstname + " " + middlename + " " + surname
print(full_name)
```

Fullname is:
 mwakanemeLE Jacqueline mmbaga

iv) d)

```
In [26]: # Display whether the student is Male or Female
print("\nIs student Male?", sex.upper() == 'M')
print("Is student Female?", sex.upper() == 'F')
```

Is student Male? False
 Is student Female? True

Question 03

a)

```
In [27]: # Given values
R = 25
C = 19e-4
L = 4e-4
E = 20
w = 5.5

# Calculate G using the formula
G = E /math.sqrt( R**2 + (2 * math.pi * w * L - 1)**2 / (2 * math.pi * w * C)**2)

# Display the value of G to 3 decimal places
print(f"The value of G is: {G:.3f}")
```

The value of G is: 0.686

b)

```
In [28]: # Given values
a = 5.6
b = 6.5
x = 12.78
y = 12.2
```

```
w = 5.5
L = 4e-4
C = 19e-4

# Calculate the value of m using the formula
m = math.sqrt(a + 3*(3 * b )**(1/3)/( x +math.sqrt(3+y)))

# Display the value of m to 5 decimal places
print(f"The value of m is: {m:.5f}")
```

The value of m is: 2.46660