Challenge 01(Day 2/100): Full Python With DSA in 100 Days with Projects

Authored by

Ashraful Islam Mahi

Founder & Owner, PytronLab

Day 2/100 : Datatypes, Typecasting, Mathematical operation & Project

2-1 : Datatypes of Python

Now lets come to our new topic, the Datatypes. I don't like to elaborate in bookish language . You can simply think datatypes as container type to store certain types of data or variable. Like we store dry foods in buckets but can't store in bottles . So the buckets can be regarded as the datatype for dry foods. Similarly there are some certain datatypes in python language to make our code more efficient.

Primarily these are the following data types in Python:

1. **Integers**
2. **Floating point numbers**
3. **Strings**
4. **Booleans**

5. **None**

Python is a fantastic language that automatically identifies the type of data for us. We can also check the types easily using *type()* function. Lets see some example:

Code-1:

```
a = 54
b = 88.44
name = "Pytronlab"
fact = True
people = None

print(type(a))
print(type(b))
print(type(name))
print(type(fact))
print(type(people))
```

Output:

```
<class 'int'>
<class 'float'>
<class 'str'>
<class 'bool'>
<class 'NoneType'>
```

You can see that type() function gives us the data types of the variables. In simple words:

Datatypes	Variables to Store
integer	whole number
float	fraction number
Strings	text or character
Booleans	Yes/True/1 and No/False/0
None	absence or Null value

One thing we need to know before moving to the next topic. That is variable naming rules.

Rules for variable naming:
• A variable name can contain alphabets, digits, and underscores.
• A variable name can only start with an alphabet and underscores.
• A variable name can't start with a digit.
• No while space is allowed to be used inside a variable name.

Now we'll see how we can convert the datatypes of variable into another type.

2-2 : Typecasting in Python

It is the process of converting the datatype of a certain variable into another variable. This can be done explicitly using built-in functions, or sometimes implicitly by the Python interpreter. Let's see the examples.

Code-2:

```
float_value = 5.7
int_value = int(float_value)
print("The typecasted value is:",int_value)
```

Output:

The typecasted value is: 5

Code-3:

```
str_value = "123.45"
float_value = float(str_value)
print("The typecasted value is: ",float_value)
```

Output:

The typecasted value is: 123.45

This is how the typecasting works. Now lets move to the mathematical operation!!!!

2-3 : Mathematical operation in Python:

There are multiple mathematical operations in python. But the most popular are these:

1. **Arithmetic operators: +, -, *, / ,//(floor operator) , **(exponent operator) , % (modulus operator) etc.**
2. **Assignment operators: =(value assign), +=, -= etc.**
3. **Comparison operators: ==(value compare), >, >=, <, != etc.**
4. **Logical or Bitwise operators: and, or, not**
5. **Mathematical functions (requires external library. It will be discussed later)**
6. **Lets see examples of some popular operations:**

Code-4: Exponential operation

```
a = 5
b = 3
result = a ** b
print(result)
```

Output:

125

Code-5: Modulus operation

```
a = 5
b = 3
result = a % b
print(result)
```

Output:

2

Code-6: Floor operation

```
a = 5
b = 3
result = a // b
print(result)
```

Output:

1

Now let's see a tricky example:

Code-7:

```
a = input("Enter 1st number: ")
b = input("Enter 2nd number: ")

sum = a + b

print("The summation is:",sum)
```

lets put a = 1 & b = 2 then what would be the answer? 12 right !

Now lets run this code.

Output:

Enter the 1st number : 1

Enter the 2nd number : 2

The summation is : 12

What !!!! Python gives you the wrong answer !! This can't be a good language right???

No, It's me who has written the wrong code!! remeber what I said in the previous day???

Everything you take input using the *input()* function is by default *strings*. That's why they've been concatenated. We've to use the concept of type casting to get rid of this issue. Lets see the right code:

Code-8:

```
a = int(input("Enter 1st number: "))
b = int(input("Enter 2nd number: "))

sum = a + b

print("The summation is:",sum)
```

Output:

Enter the 1st number : 1

Enter the 2nd number : 2

The summation is : 3

Hurrah !!! Our code gives the right answer now!!!

2-4 : Practice Problems

Okay that's enough coding example for today. Now it is time for exercise.

I'm not directly providing the solutions here. You must try on your own. If you can't solve this after multiple trying , then visit my github from this link and don't forget to give a star to this repo!!!

challange_01_Full_Python_with_DSA-_in_100_days/Day_2/Exercise at main · aimG313/challange_01_Full_Python_with_DSA-_in_100_days

This is my challange to complete entire python programming language including beginning, intermidiate, advanced & DSA level - aimG313/challange_01_Full_Python_with_DSA-_in_100_days

https://github.com/aimG313/challange_01_Full_Python_with_DSA-_in_100_days/tree/main/Day_2/Exercise

Practice-1:

Calculate the Area of a Circle based on user input radius

Input:

Enter the radius of the circle (in cm) : 5

Output:

The area of the circle is (in sqcm) : 78.5

Practice-2:

Convert Temperature from Celsius to Fahrenheit

Input:

Enter temperature in Celsius: 45

Output:

The temperature in Fahrenheit is: 113.0

Practice-3:

Simple Interest Calculator

Input:

Enter the principal amount: 5000
Enter the rate of interest: 10
Enter the time period in years: 5

Output:

The simple interest is: 2500.0

Practice-4:

Swap Two Numbers using a 3rd variable

Input:

Enter the first number: 54
Enter the second number: 21

Output:

After swapping: First number = 21 , Second number = 54

Practice-5:

Convert Seconds to Hours, Minutes, and Seconds

Input:

Enter the number of seconds: 100000

Output:

27 hours, 46 minutes, 40 seconds

Okay that's enough exercise for today. Let's make a project now.

2-5: Project-2 : Personal Budget Generator Project

Let's make a Personal Monthly Budget Generator using Python !!!

Project:

```
print("Welcome to Personal Budget Calculator")

# Input income
income = float(input("Enter your monthly income: "))

# Input expenses
print("Enter your expenses for the following categories:")
food_expense = float(input("Food: "))
rent_expense = float(input("Rent: "))
entertainment_expense = float(input("Entertainment: "))
utilities_expense = float(input("Utilities: "))
other_expense = float(input("Others: "))

# Calculate total expenses
total_expenses = food_expense + rent_expense + entertainment_expense + utilities_expens

# Calculate savings
savings = income - total_expenses

# Display summary
print("\n----- Budget Summary -----")
print("Monthly Income: $", income)
print("Total Expenses: $", total_expenses)
print("    Food: $", food_expense)
print("    Rent: $", rent_expense)
print("    Entertainment: $", entertainment_expense)
print("    Utilities: $", utilities_expense)
print("    Others: $", other_expense)
print("Savings: $", savings)
print("---------------------------")
```

Input:

Enter your monthly income: 10000
Enter your expenses for the following categories:
Food: 500
Rent: 2000
Entertainment: 500
Utilities: 700
Others: 300

Output:

---- Budget Summary -----
Monthly Income: $ 10000.0
Total Expenses: $ 4000.0
Food: $ 500.0
Rent: $ 2000.0
Entertainment: $ 500.0
Utilities: $ 700.0
Others: $ 300.0
Savings: $ 6000.0

Yay!!! Congratulations!!! we've made another project using python and we'll make 98 projects more. Till then stay tuned.

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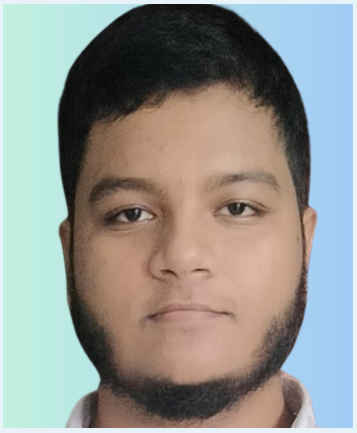

Ashraful Islam Mahi

Founder & CEO , Pytronlab

Profile Link: https://www.linkedin.com/in/ashraful-islam-mahi/

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