

Week 3

Introduction to Python: Strings, Integers, and Floats

Review from Last Week

- ▶ The code to have your program say a personal hello to you:

- `name = input('Give your name : ')`
 - `print('Hello ' + name)`

- ▶ In this code:

- ▶ name is variable
 - ▶ the program always reads user input as a string
 - ▶ What is a variable and string? Let's find out!

What is a variable?

- ▶ Imagine you have a box labeled `CANDY`.
Inside the box `CANDY`, there are 20 pieces of candy.
Then, we can say `CANDY = 20`.
- ▶ OR
- ▶ Let's say we have a cage `BIRD_CAGE`.
Inside the cage `BIRD_CAGE`, we have a parrot.
Then, `BIRD_CAGE = parrot`.
- ▶ In these examples, the variables are `CANDY` and `BIRD_CAGE`. These are like containers which hold the values 20 and parrot, respectively.
- ▶ In Python, we can write these variables as follows:
 - `CANDY = 20`
 - `BIRD_CAGE = 'parrot'`

Going back to last week...

- ▶ Let's go back to our code from last week:
 - `name = input('Give your name : ')`
 - `print('Hello ' + name)`
- ▶ **name** is a variable that stores the value that the user inputs, meaning that name is a container that holds the name of the user
- ▶ In the terminal, the session could go as follows:

```
Give your name : Miss Maria
```

```
Hello Miss Maria
```

What is a string?

- ▶ A string in Python is a type of value that is encompassed by quotes
- ▶ Correct examples:
 - `string1 = 'hello'`
 - `string2 = '12'` `#a string can be a number, but we cannot do math`
 `#unless we convert it to an integer`
- ▶ Incorrect examples:
 - `string3 = "hello"` `#two different types of quotation marks`
 - `string4 = 12` `#a string must include quotation marks`
- ▶ Note: in Python we can make notes in our code using `#`
(the program does not read anything in the line after `#` as code)

When we do “math” with strings...

- ▶ String concatenation happens!
- ▶ Ex:

Script	Shell/Terminal
<pre>➤ S1 = 'Miss Maria' ➤ S2 = 'is' ➤ S3 = 'your teacher.' ➤ S = S1+S2+S3 ➤ print(S1) ➤ print(S2) ➤ print(S3) ➤ print(S)</pre>	<pre>➤ Miss Maria ➤ is ➤ your teacher. ➤ Miss Maria is your teacher.</pre>

Moving on to Integers!

- ▶ Integers are whole numbers (not fractions or decimals!)
- ▶ to convert a string number to an integer type → use `int()` function

Script	Shell/Terminal
<pre>➤ s1 = '34' ➤ s2 = '12' ➤ n1 = int(s1) # int() takes away quotes ➤ n2 = int(s2) ➤ print(s1 + s2) ➤ print(n1 + n2)</pre>	<pre>➤ 3412 ➤ 46</pre>

Going from an integer to a string

- ▶ To convert an integer to a string → use `str()` function

Script	Shell/Terminal
<pre>➤ s = 'Number = ' ➤ n = 123 ➤ print(s + n + '.')</pre>	<pre>➤ Error! (Does not work.)</pre>

- ▶ The above does not work because we cannot “add” (concatenate) a string and an integer since they are different types!

Script	Shell/Terminal
<pre>➤ s = 'Number = ' ➤ n = 123 ➤ n = str(n) ➤ print(s + n + '.')</pre>	<pre>➤ Number = 123.</pre>

One more type: float

- ▶ In simple words, a float is a decimal number.
 - `f = 1.23243235345`
- ▶ To convert to a string from a float:
 - `s = str(f)`
- ▶ To convert to an integer from a float:
 - `n = int(f)` # this cuts off the numbers after the decimal point
- ▶ To convert to a float from a string:
 - ▶ `s = '12.2'`
 - ▶ `f = float(s)`
- ▶ Note : You can add a float and integer mathematically.