

PYTHON PART III

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OUTLINE

- Python Syntax
- Python variable
- Data type in python
- Python comments

PYTHON NUMBERS

- There are three numeric types in Python:

- int

```
x = 1    # int
```

- float

```
y = 2.8  # float
```

- Complex

```
z = 1j    # complex
```

- Exercise : Use method `type()` to test above variable data type?

PYTHON NUMBERS

- **Int** : Int, or integer, is a whole number, positive or negative, without decimals, of unlimited length.

```
x = 1  
y = 35656222554887711  
z = -3255522
```

- **Float** : Float, or "floating point number" is a number, positive or negative, containing one or more decimals.
- Float can also be scientific numbers with an "e" to indicate the power of 10.

```
x = 35e3  
y = 12E4  
z = -87.7e100
```

PYTHON NUMBERS

- **Complex** : Complex numbers are written with a "j" as the imaginary part:

```
x = 3+5j
```

```
y = 5j
```

```
z = -5j
```

TYPE CONVERSION

- You can convert from one type to another with the **int()**, **float()**, and **complex()** methods:

```
x = 1      # int
y = 2.8    # float
z = 1j     # complex
```

```
#convert from int to float:
a = float(x)
```

```
#convert from float to int:
b = int(y)
```

```
#convert from int to complex:
c = complex(x)
```

Exercise

Try to print the type
and the value for x
and y and z.

RANDOM NUMBER

- Python **does not** have a random() function to make a random number, but Python has a built-in module called random that can be used to make random numbers:

```
import random
```

```
print(random.randrange(1, 10))
```

EXERCISE

- Write the correct syntax to convert x into a decimal number.
- $X = 5$

- The following code example would print the data type of x, what data type would that be?

```
x = "Hello World"  
print(type(x))
```



PYTHON CASTING

- There may be times when you want to specify a type on to a variable.
- This can be done with **casting**.
- Python is an object-orientated language, and as such it uses classes to define data types, including its primitive types.

PYTHON CASTING

- Casting in python is therefore done using constructor functions:
- **int()** - constructs an integer number from an integer literal, a float literal (by rounding down to the previous whole number), or a string literal (providing the string represents a whole number)
- **float()** - constructs a float number from an integer literal, a float literal or a string literal (providing the string represents a float or an integer)
- **str()** - constructs a string from a wide variety of data types, including strings, integer literals and float literals

PYTHON CASTING – EXAMPLES

```
x = int(1)    # x will be 1
y = int(2.8)  # y will be 2
z = int("3")  # z will be 3
```

```
x = float(1)    # x will be 1.0
y = float(2.8)  # y will be 2.8
z = float("3")  # z will be 3.0
w = float("4.2") # w will be 4.2
```

```
x = str("s1")  # x will be 's1'
y = str(2)     # y will be '2'
z = str(3.0)   # z will be '3.0'
```

PYTHON STRINGS

- String literals in python are surrounded by either single quotation marks, or double quotation marks.

'hello' is the same as "hello".

- You can assign a multiline string to a variable by using three quotes:

```
a = """Lorem ipsum dolor sit amet,  
consectetur adipiscing elit,  
sed do eiusmod tempor incididunt  
ut labore et dolore magna aliqua."""  
print(a)
```

PYTHON STRINGS

- String Length
- To get the length of a string, use the `len()` function.

```
a = "Hello, World!"  
print(len(a))
```

PYTHON BOOLEANS

- In programming you often need to know if an expression is True or False.
- You can evaluate any expression in Python, and get one of two answers, True or False.
- When you compare two values, the expression is evaluated and Python returns the Boolean answer:

```
print(10 > 9)  
print(10 == 9)  
print(10 < 9)
```

Find output

```
x = "Hello"  
y = 15  
  
print(bool(x))  
print(bool(y))
```