Lecture 01: Introduction to Python

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1 Introduction to Python

Content adopted from Pierian Data

2 What is Python and why use it

- **high-level**,
- **interpreted**,
- **general-purpose** programming language that is used for a wide range of applications.
- It is easy to learn, powerful, and
- has a large community of users.

3 Why is it called Python?

When he began implementing Python, Guido van Rossum was also reading the published scripts from "Monty Python's Flying Circus", a BBC comedy series from the 1970s. Van Rossum thought he needed a name that was short, unique, and slightly mysterious, so he decided to call the language Python.

–General Python FAQ

4 Variable

A variable is a named storage location used to hold a value. The value of a variable can be changed and it can be used in expressions and operations

5 Variable Assignment

- Rules for variable names
- names can not start with a number
- names can not contain spaces, use _ intead
- names can not contain any of these symbols: `'",<>/?|\!@#%^&*~-+`

- accoding to Style Guide for Python Code (PEP8), it's considered best practice that names are lowercase with underscores
- avoid using Python built-in keywords like `list` and `str`
- avoid using the single characters l (lowercase letter el), O (uppercase letter oh) and I (uppercase letter eye) as they can be confused with 1 and 0

6 Dynamic Typing

Python uses *dynamic typing*, meaning you can reassign variables to different data types. This makes Python very flexible in assigning data types; it differs from other languages that are statically typed.

[ ]:

```
my_cat = 2
my_cat
```

[ ]:

```
my_cat = ['Basbousa', 'Lucy']
my_cat
```

7 Pros and Cons of Dynamic Typing

- Pros of Dynamic Typing
  - very easy to work with
  - faster development time
- Cons of Dynamic Typing
  - may result in unexpected bugs!
  - you need to be aware of type()

8 Assigning Variables

Variable assignment follows `name = object`, where a single equals sign `=` is an assignment operator

[ ]:

```
a = 5
a
```

9 Reassigning Variables

Python lets you reassign variables with a reference to the same object.

[ ]:

```
a = a + 10
a
```

There's actually a shortcut for this. Python lets you add, subtract, multiply and divide numbers with reassignment using `+=`, `-=`, `*=`, and `/=`.

[ ]:

```
a += 10
a
```

[ ]:

```
a *= 2
a
```

10 Determining variable type with `type()`

You can check what type of object is assigned to a variable using Python's built-in type() function. Common data types include:

[ ]:

```
type(a)
```

11 Numbers

Basically there are two types of numbers: - 2 is interger `int` - 2.0 is floating point `float`

Example	Number Type
1,2,-5,1000	Integers
1.2,-0.5,2e2,3E2	Floating point

[ ]:

```
type(2)
```

[ ]:

```
type(2.0)
```

Basic Arithmetic 1/2

[ ]:

```
2+1 # Addition
```

[ ]:

```
2-1 # Subtraction
```

[ ]:

```
2*2 # Multiplication
```

[ ]:

```
3/2 # Division
```

Basic Arithmetic 2/2

[ ]:

```
2**3 # Powers
```

Question: how to calculate the sequare root of 16?

12 Order of Operations

[ ]:

```
2 + 10 * 10 + 3
```

[ ]:

```
(2+10) * (10+3)
```

[ ]:

```

```