
Introduction to Python

— Tuan Nguyen - AI4E —

Introduction

- Giảng viên Khoa Toán Kinh tế, Đại học Kinh tế Quốc dân.
- Tuan <https://nttuan8.com/>, founder: AI For Everyone (AI4E).
- The author of deep learning series, GAN series.
- The author of e-book deep learning,
<https://nttuan8.com/sach-deep-learning-co-ban/>
- Deep learning, python teachers.

Outline

- Programming language?
- Interpreter
- Why Python for data science?
- Python 2 vs Python 3
- Environment
- Print
- Input
- Comment

Programming Language



Find flights
to Hawaii



```
01100
10110
11110
```

Programming Language



Find flights
to Hawaii



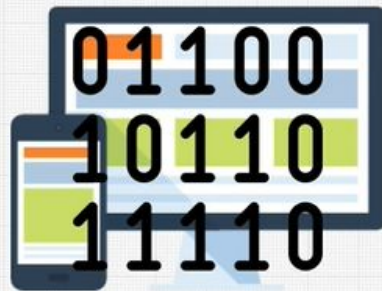
01100
10110
11110

Python code (.py)

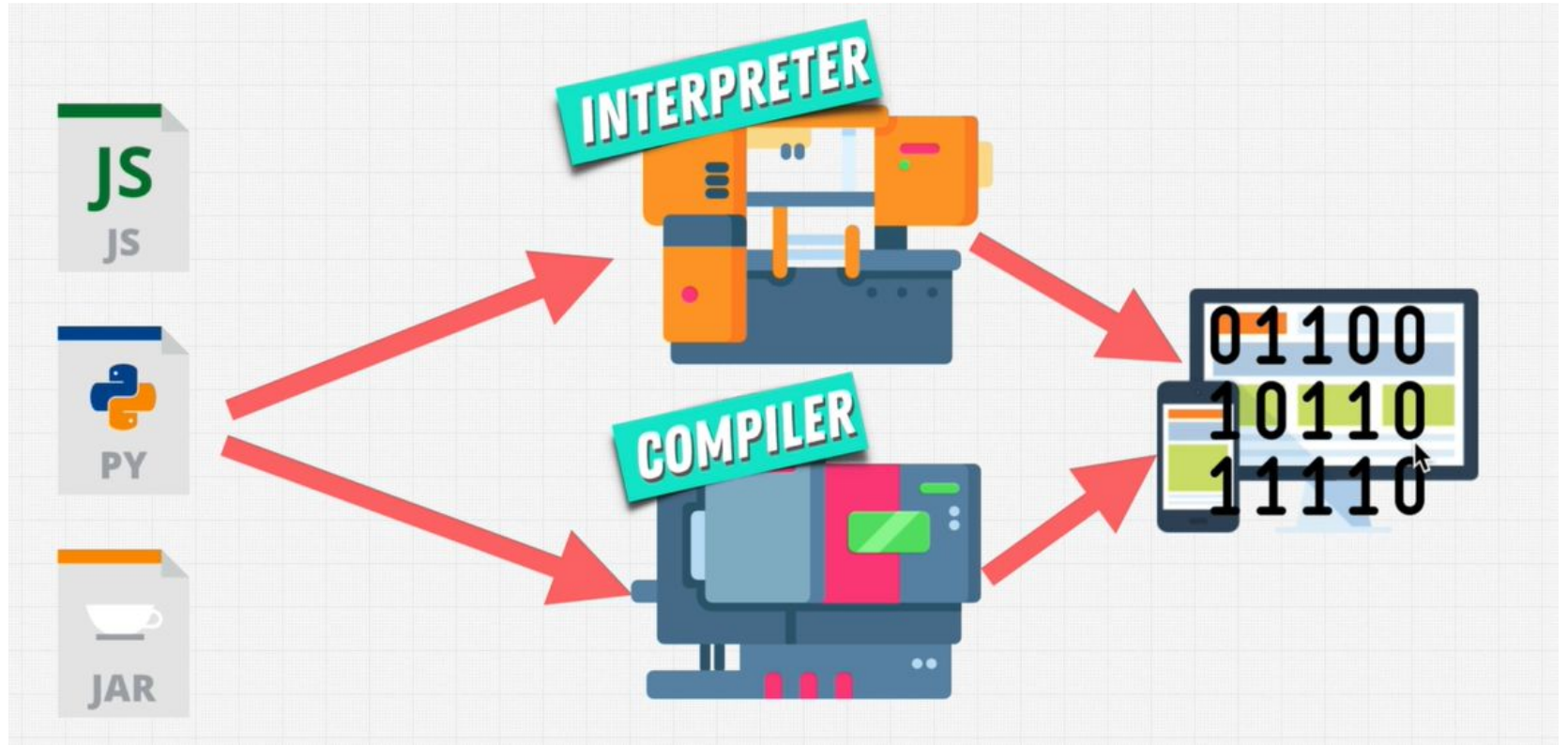
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
numOfPoint = 30
#noise = np.random.normal(0,1,numOfPoint).reshape(-1,1)
#x = np.linspace(30, 100, numOfPoint).reshape(-1,1)
#N = x.shape[0]
#y = 15*x + 8 + 20*noise
#plt.scatter(x, y)

data = pd.read_csv('data_linear.csv').values
N = data.shape[0]
x = data[:, 0].reshape(-1, 1)
y = data[:, 1].reshape(-1, 1)
plt.scatter(x, y)
plt.xlabel('mét vuông')
plt.ylabel('giá')
```

Translator



Interpreter



High level vs low level programming language

Levels of Programming Languages

High-level program

```
class Triangle {  
    ...  
    float surface()  
        return b*h/2;  
}
```

Low-level program

```
LOAD r1,b  
LOAD r2,h  
MUL r1,r2  
DIV r1,#2  
RET
```

Python

- Development started in the 1980's by Guido van Rossum.
 - Only became popular in the last decade or so.
- Interpreted, very-high-level programming language.
- OOP, functional, procedural, logic, structured, etc.
- Simple programming language.

Python is simple

C:

```
1 #include <stdio.h>
2 int main(void){
3     printf("Hello, world!\n");
4 }
```

C++:

```
1 #include <iostream>
2 int main(){
3     std::cout << "Hello, world!\n";
4 }
```

Python (v2.x):

```
1 print "Hello, world!"
```

Java:

```
1 public class HelloWorld {
2     public static void main(String[] args) {
3         System.out.println("Hello, world!");
4     }
5 }
```

Why Python for data science?

- Powerful and Easy to use
- Libraries: massive database of libraries and artificial intelligence and machine learning: Numpy, Pandas, Scikit Learn, TensorFlow, Seaborn, Pytorch, Matplotlib.
- Visualization and Graphics: varied visualization options: Matplotlib, Seaborn.

Python version



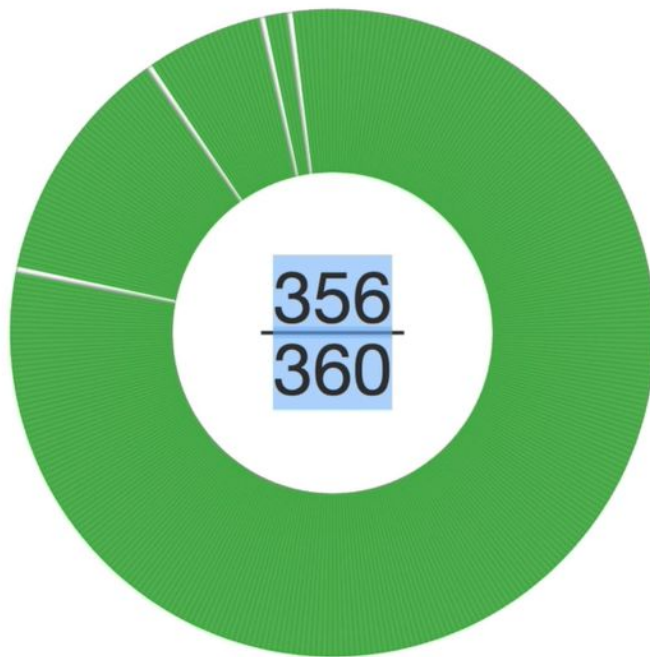
Compare Python3 vs Python2

Basis of comparison	Python 3	Python 2
Release Date	2008	2000
Function print	<code>print ("hello")</code>	<code>print "hello"</code>
Division of Integers	Whenever two integers are divided, you get a float value	When two integers are divided, you always provide integer value.
Unicode	In Python 3, default storing of strings is Unicode.	To store Unicode string value, you require to define them with "u".
Syntax	The syntax is simpler and easily understandable.	The syntax of Python 2 was comparatively difficult to understand.

Python 3 domination

Python 3 Readiness

Python 3 support graph for 360 most popular Python packages!



Environment

- Installation
 - Python 3 (<https://www.python.org/downloads/>)
 - Code editor/IDE (vs code, pycharm, spyder, jupyter notebook)
- Non-installation
 - Google colab (<https://colab.research.google.com/>)
 - Repl.it (<https://repl.it/~>)

Hello world

- `print(value)`: in giá trị ra màn hình

```
print("Hello world")
```

```
print(3)
```

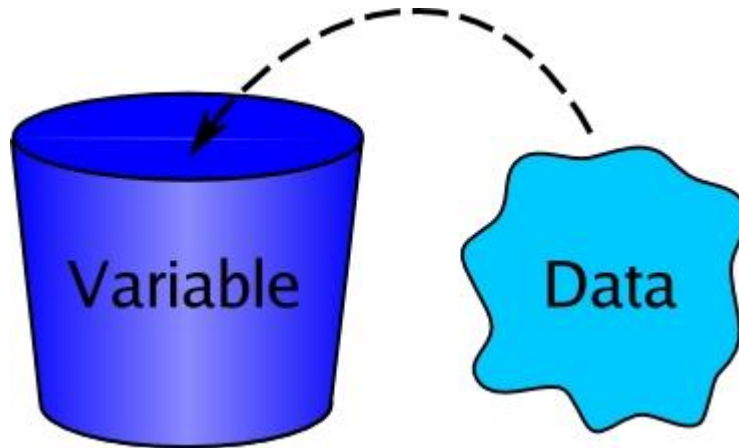
```
print(3.6)
```

Variable

name = "Thanh Tuan"

group = "AI4E"

age = 20



Variable name

- Meaningful
- Must start with a letter or the underscore character
- Cannot start with a number
- Can only contain alpha-numeric characters and underscores (A-z, 0-9, and _)
- Case-sensitive (age, Age and AGE are three different variables)

Variable name check

myvar = "John"

my_var = "John"

2myvar = "John"

_my_var = "John"

myVar = "John"

my-var = "John"

MYVAR = "John"

myvar2 = "John"

my var = "John"

Input

```
name = input("What's your name?")  
print("Hello " + name)
```

BT: Cho người dùng nhập tên, quê quán. In ra thông tin của người dùng dưới format: "Chào bạn ..., đến từ"

Exercise

Cho người dùng nhập tên, quê quán. In ra thông tin của người dùng.

Comment

- Comment 1 dòng
This is a comment
- Comment nhiều dòng

'''

If I really hate pressing `enter` and
typing all those hash marks, I could
just do this instead

'''

Exercise

1. Viết chương trình cho người dùng nhập: tên, tuổi, chiều cao, quốc tịch. In ra các thông tin của người đấy.
2. Cho nhập năm sinh, in tuổi.

Exercise

1. Nhập vào 2 số a, b. Tính $a+b$, $a-b$, $a*b$, a/b . Ví dụ $a = 3$, $b = 5$, in ra theo cú pháp:

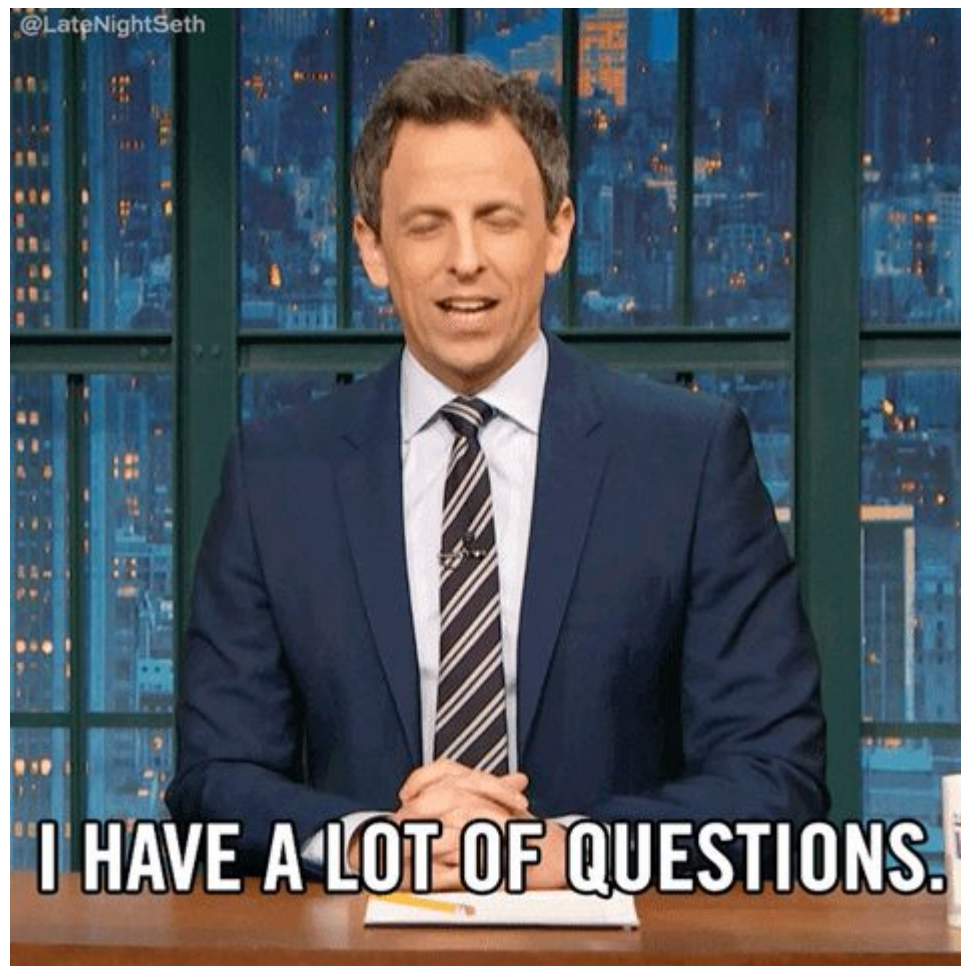
$$3 + 5 = 8$$

$$3 - 5 = -2$$

$$3 * 5 = 15$$

$$3 / 5 = 0.6$$

Q&A



The end

