Python Session 1

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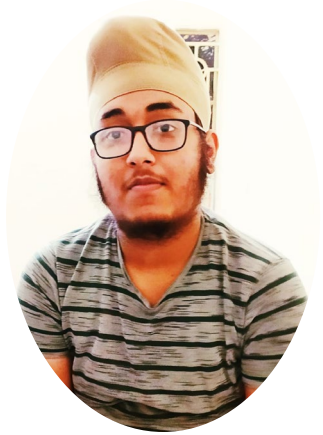

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PART 1
Introduction and Setup

Python

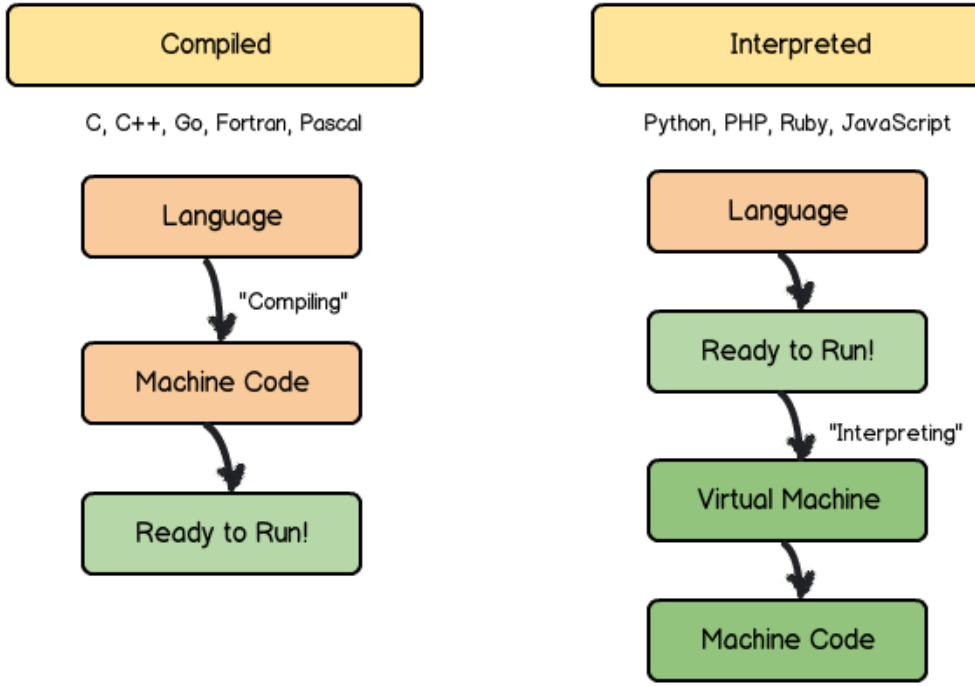
- Introduced in 1991 by Guido van Rossum
- Named after a British comedy troupe Monty Python

Python

- Interpreted Language
- Very simple Syntax
- General Purpose
- Highly Versatile
- Object-Oriented
- Very Popular

Python as an Interpreted Language

- Interpreted languages are directly run without needing compilation to machine instructions.



Readability

- Python promotes readability and simple syntax
- almost “reads as English”

For example,

if the number is more than 2, print “more than 2”

```
x = 3
if x > 2:
  print("more than 2")
```

Uses of Python

Owing to its features and ease of use, Python has found its place as one of the most popular programming languages.

Below is an incomplete list of usages and some associated libraries:

- Web Apps (Django, Flask)
- Web Scraping (Requests, BeautifulSoup)
- Scientific Computing (NumPy, Pandas, SciPy)
- Data Science (Matplotlib, Seaborn, Pandas, NumPy)
- Machine Learning (Scikit-Learn, TensorFlow)
- Game Development and GUI Apps (PyGame, Tkinter, Kivy)
- Finances and Blockchain

etc.

Ways of Running a Python Program

- Offline

  Install the Python Interpreter from python.org
  (other ways include Anaconda, etc.)

- Online

  There are many online services that run Python code
  We will use Google Collaboratory

Installing Python

Get the latest python version from python.org according to your OS

- For Windows 7 or earlier, install Python 3.8.10: https://www.python.org/ftp/python/3.8.10/python-3.8.10-amd64.exe
- For Windows 8 and above, install Python 3.10.5: https://www.python.org/ftp/python/3.10.5/python-3.10.5-amd64.exe

- For macOS: https://www.python.org/ftp/python/3.10.5/python-3.10.5-macos11.pkg

Using an IDE

- When writing code offline, it’s convenient to have an IDE
- There are various IDEs for Python, namely:
  - VS Code
  - PyCharm
  - Atom
  - Spyder

  etc.

  I will use VS Code and PyCharm as convenient

VS Code and PyCharm

- VS Code: https://code.visualstudio.com/Download
- PyCharm: https://www.jetbrains.com/pycharm/download/

Google Collaboratory

- Google Collaboratory
  https://colab.research.google.com/

PART 2
Working with Numbers

Variables

- As the name suggests, variables store data that may vary
- In python we directly assign to a variable, without any explicit type

```
x = 3
# value of x is 3
# value of 3 is assigned to the variable x
```

Working with Variables

```
a = 3
b = 5
a = 6
b = a
```

a	UNDEFINED	UNDEFINED
b	UNDEFINED	UNDEFINED

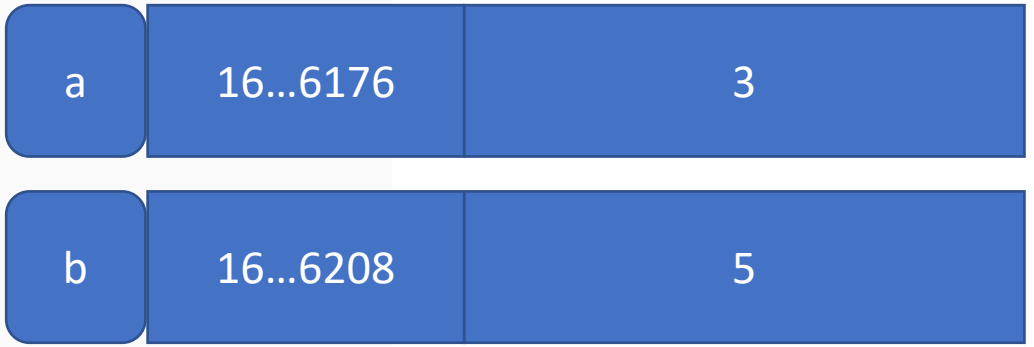
Working with Variables

```
a = 3
b = 5
a = 6
b = a
```

a	16…6176	3
b	UNDEFINED	UNDEFINED

Working with Variables

```
a = 3
b = 5
a = 6
b = a
```



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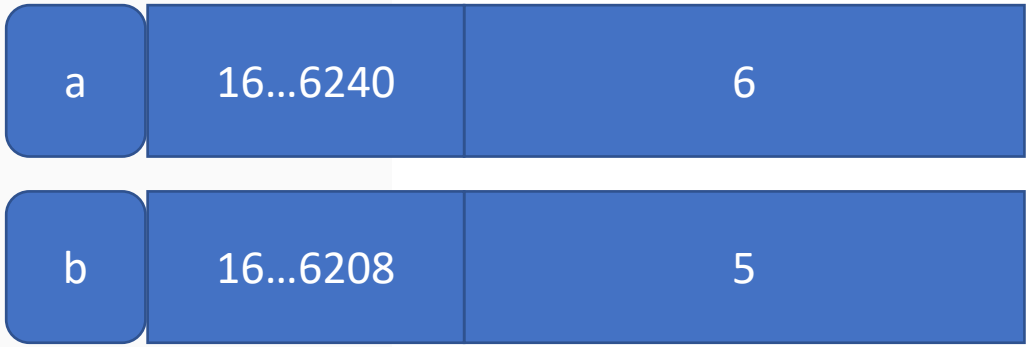

Working with Variables

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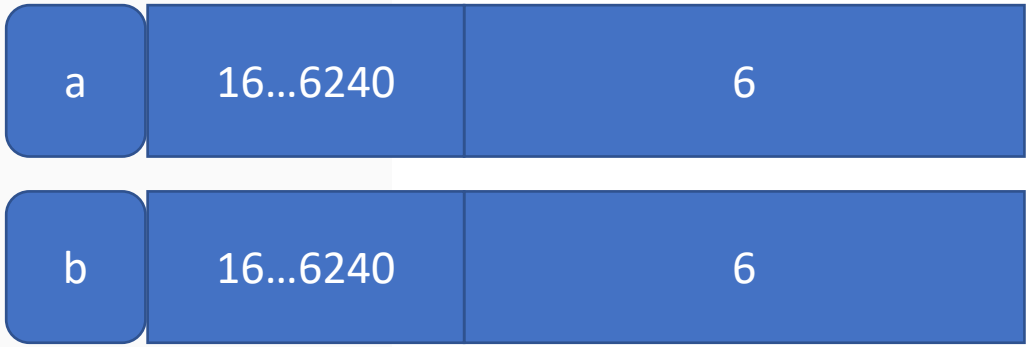

Numerical Data Types

- int integers
  5, 6, 50, etc.
- float floats, real numbers
  5.0, 2.25, 3.33, math.pi, etc.

Basic Arithmetic

+	Addition
-	Subtraction
*	Multiplication
/	Division
**	Exponents
//	Integer Division
%	Modulus (only defined for type `int`)

Shorthand Statements

There are shorthand statements in Python.

For a variable **x**, expressions **E** and **E’** and a valid operator **o**:

x = E

x o= E’

is equivalent to

x = E

x = x o E’

or,

x = E o E’

Shorthand Statements: Example

For addition operator:

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

is equivalent to:

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

or,

```
x = 3 + 5
```

Practice

- Using the CLI interpreter, use Python as a calculator

```
C:\Users\sroyw>py
Python 3.10.5 (tags/v3.10.5:f377153, Jun  6 2022, 16:14:13) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> # Using Python as a calculator
>>> 5 + 6
11
>>> x = 5
>>> y = 6
>>> x ** y
15625
>>>
```

Thank You