Introduction to Python

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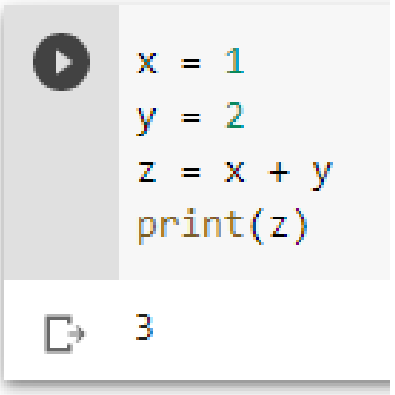
Brief background + history

- One of the most popular programming languages, second only to JavaScript
- General purpose language
- Philosophy is readability
- Object oriented approach helps programmers write clear, logical code for small- or large-scale projects
  - print(z), objects are both data and code
- Dutch programmer Guido van Rossum created Python because he was bored over Christmas holiday in 1989.
  - Name comes from his love of Monty Python
- Licensed by the Python Software Foundation. An American nonprofit.
- Open-source
- Current version is 3.0 (released in 2008).



Zen of Python

- Beautiful is better than ugly
- Explicit is better than implicit
- Simple is better than complex
- Complex is better than complicated
- Readability counts

Common Uses of Python

- Web Development
- Scientific
  - NumPy (array facility)
  - Pandas (data analysis and modeling)
- Machine Learning / Artificial Intelligence
  - Tensorflow (Developed by Google)
  - Keras (Open-source neural network library)
  - PyTorch (Open-source machine learning used for developing and training neural networks)
- Computer Vision
  - OpenCV
- Web Scraping
- Data Science & Data Analysis
  - Matplotlib
  - Seaborn

Biomedical Python Examples

- IdentiCyte: Simple red blood cell identification software – ScienceDirect
  - A program created to quickly count and identify RBCs from microscope images.
- Jill Cates - How to Build a Clinical Diagnostic Model in Python - PyCon 2019 – YouTube
  - This could be helpful for your final project…. (cough cough)

Helpful Links

- Starter's Guide:
  - Introduction · HonKit (swaroopch.com)
- Video Series:
  - Python & PyCharm Setup : Getting Started – YouTube
- Anaconda Environment:
  - Getting started — Anaconda documentation
- Medical Focused Beginner Video Series:
  - Data Science for Healthcare: Python Fundamentals - YouTube

Important Terms

- Boolean (bool)
  - True or False
- Integer (int)
  - 42
- String (str)
  - “Hello” “Student” “Test” “These are words”
- List (list)
  - [1, 2, 3, 4]
  - [1, two, 3, four]
- Range (range)
  - (1, 10)

Exercise Links

- Bee based image manipulation exercise (completed)
- Image files for exercise
- Blank version for you to practice on