# Python in 10 minutes

Part 10

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Purpose:

- Quick, bite-size guides to basic usage and tasks in Python

- I'm no expert, I've just used it for various tasks, and it has made my life easier and allowed me to do things I couldn't manually

- I'd like to share that working knowledge with you

Lesson 10: Stepping Out Beyond Hello World
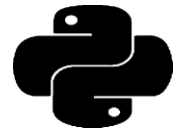
Last time, we worked with Python add-ons and in doing so, cracked open a door to the wide world of possibilities that Python holds. Today, we'll finish this series by opening that door even wider through showcasing advanced topics Python can tackle. Topics include:

1) Web Scraping (Scrapy, BeautifulSoup)
2) Web Frameworks (Django, Flask)
3) Game Development (PyGame)
4) Machine learning (TensorFlow, Keras)
5) Bioinformatics (BioPython)

Lesson 10: Web Scraping

Definition: the collection of data from websites typically achieved through an automatic process such as a web crawler

Scrapy

- Widely used for web scraping and other tasks, including automated testing, data mining, and web crawling

- Fast and high-level method for creating spiders to crawl a website and extract data

BeautifulSoup

- Used for web scraping, especially quick-turnaround screen scraping projects

- Features simple methods, automatic Unicode conversion, and use of popular parsers

Lesson 10: Web Frameworks

Definition: software designed to support the development of web applications like webpages, services, resources, and APIs

Django

- High-level web framework that can generate a variety of websites quickly

- Fast, secure, and scalable with unambiguous documentation

- Includes many features for common web development tasks

Flask

- Micro framework aimed at keeping core code simple but extendible

- Doesn't make decisions for you or include functions that other libraries already do

- Great for getting started, hard to create a big website

Lesson 10: Game Development

Pygame

- Set of modules for creating video games, especially 2D games
- Simple and easy to use with multi-core CPU functionality, high portability, no strict GUI requirements, modularity, and more
- Supports a wide range of platforms/operating systems
- Many current projects available
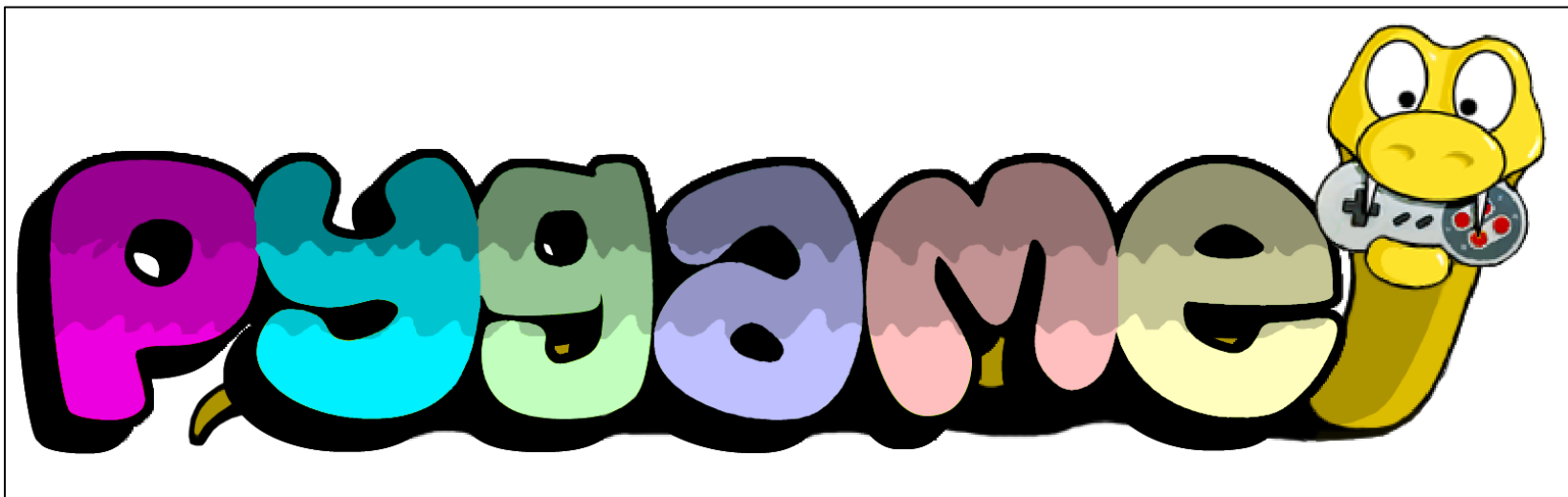
Lesson 10: Machine Learning

Definition: using computer algorithms that improve automatically by experience, typically with the use of training data

Tensor Flow

- Computational library for developing and training machine learning models

- Optimized for speed with features such as a responsive construct, flexibility, and easy trainability

- Easy model building and walkthroughs for common problems

Keras

- Machine learning library for expressing neural networks

- Uses TensorFlow or Theano (another machine learning library) internally

- Slower but very powerful, well supported, and deployable

Lesson 10: Bioinformatics

Definition: use of computational methods to understand complex biological data, especially genomic information

Biopython

- Set of tools for computational molecular biology

- Includes parsers for common bioinformatics file formats like BLAST, Clustalw, FASTA, and Genbank

- Access to online services like NCBI's Blast, Entrez, and PubMed and ability to interface with other bioinformatics software

- Common tasks involve sequence manipulation, annotation, input/output, alignment, and BLASTing
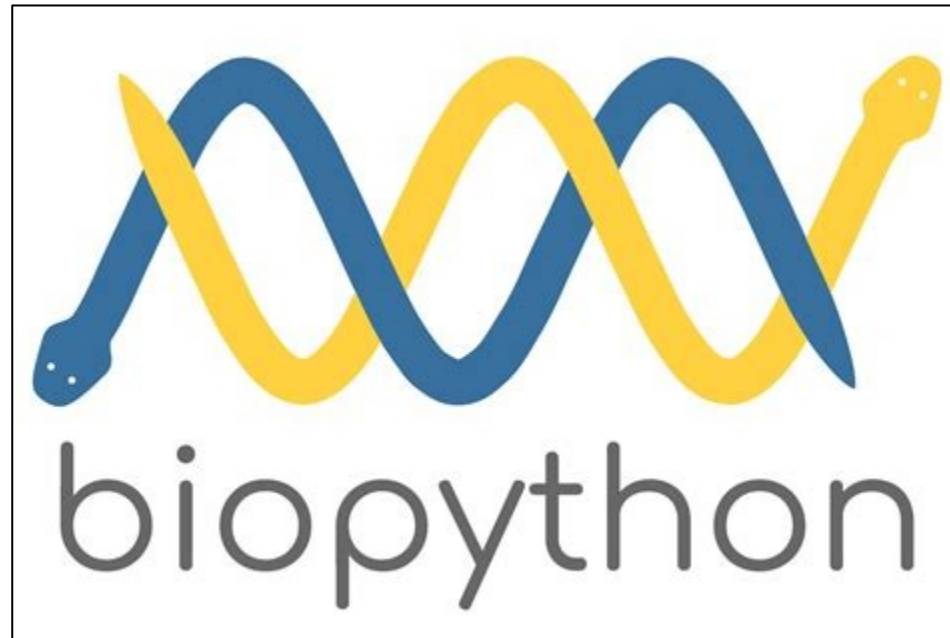
Lesson 10: Summary

- Python is a great tool to have at your disposal, whether you are a researcher, web developer, coding enthusiast, or anything else

- Through this series we've gone from opening Python for the first time to exploring advanced topics such as bioinformatics or web design

- I hope these quick guides helped you start your Python journey and pointed the way to wider Pythonic horizons

- Please complete a brief, 5-question assessment:

  - https://und.qualtrics.com/jfe/form/SV_e3T702oIifBx1tk

Lesson 10: Resources

Lists for Top Libraries:

- https://hackr.io/blog/top-python-libraries
- https://tryolabs.com/blog/2020/12/21/top-10-python-libraries-of-2020/
- https://geekflare.com/popular-python-libraries-modules/
- https://www.edureka.co/blog/python-libraries/

Lists for Top Books:

- https://www.guru99.com/best-python-books.html
- https://hackr.io/blog/best-python-books-for-beginners-and-advanced-programmers

Websites for Specific Libraries:

- https://scrapy.org/
- https://www.crummy.com/software/BeautifulSoup/
- https://beautiful-soup-4.readthedocs.io/en/latest/#
- https://www.djangoproject.com/
- https://flask.palletsprojects.com/en/1.1.x/
- https://www.pygame.org/news
- https://www.tensorflow.org/
- https://keras.io/
- https://biopython.org/