Astroscholars
Intro to computing

Cami Pacifici and Nadia Dencheva

Astroscholar: Intro to Computing

- What is a computer program?
- What is Python?
- How to run Python
- Introduction to Python

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But before we get into it…

This is a class to get you into computing.
If it is easy for you, please help your peers.
If it is difficult for you, please ask for help.

The goal is NOT to get you to be a professional developer. The goal is to get you to think “oh, it is not that scary”.

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What is a computer program?

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e.g., your favorite social media app uses an algorithm to decide what posts to show you

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What is Python?

Python is an **interpreted**, high-level, general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python's design philosophy emphasizes code **readability** with its notable use of significant whitespace.

Python is **dynamically typed** and **garbage-collected** (a form of automatic memory management). It supports multiple programming paradigms, including procedural, object-oriented, and functional programming.

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In simpler words: Python has been created to be intuitive and flexible and it is very widely used, which means that you can find a lot of help just googling your question.

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What does “dynamically typed” mean?

The process of verifying and enforcing the constraints of types is called type checking. Type checking may occur either at compile-time (a static check) (C, C++, Fortran) or at run-time (dynamic check) (Python, Javascript, PHP, Ruby). Dynamically typed languages are generally slower but more flexible.

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What is Python?

Why is Python so popular in astronomy?

- Easy to start using it and do meaningful things

- Good support for numerical and scientific libraries

- Good plotting libraries - publication quality plots

- Large and very responsive community which supports the language and associated tools

- Open source

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How to run Python

Most operating systems already provide a python interpreter. If you need to install it yourself, **conda** is a good package manager. Basically, it lets you install software and keep it into containers so you can install multiple versions without them bothering each other.

Packages can then be installed via conda itself or using **PyPi** which is another way to upload and store packages when ready to be installed.

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How to run Python

How to run Python:

- With Jupyter Notebooks
- The default python shell
- The interactive python shell (ipython)
- Running scripts (do_what_i_need.py)

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To keep things simple and not have to worry about installations, we will use Google Collab which provides Jupyter Notebooks with Python and other packages already installed and ready to be used through the browser.

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Questions?

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Introduction to Python