PROGRAMMING WITH PYTHON

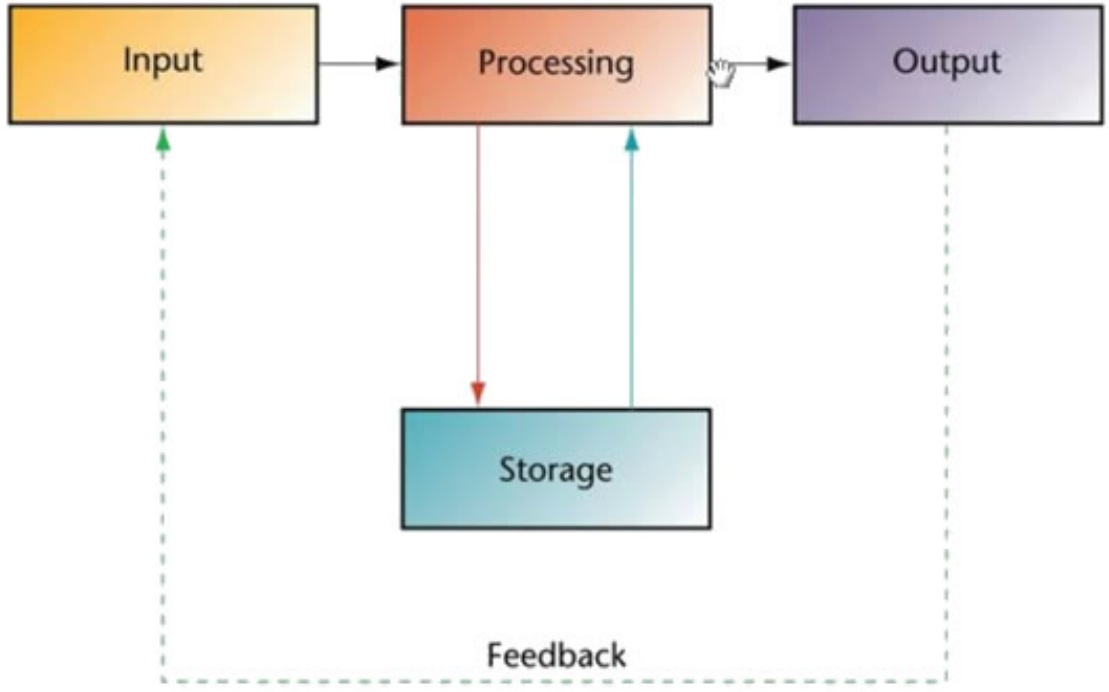
UNDERSTANDING WHAT PYTHON IS AND WHAT IT CAN BE USED FOR

WHAT IS PROGRAMMING?

A way to instruct a computer to perform tasks.

There are numerous programming languages, the choice of which can depend upon:

- Availability within the given context
- Suitability for performing a particular task
- Knowledge of the programmer and other users


Input
Processing
Output
Storage
Feedback

WHAT IS PYTHON?

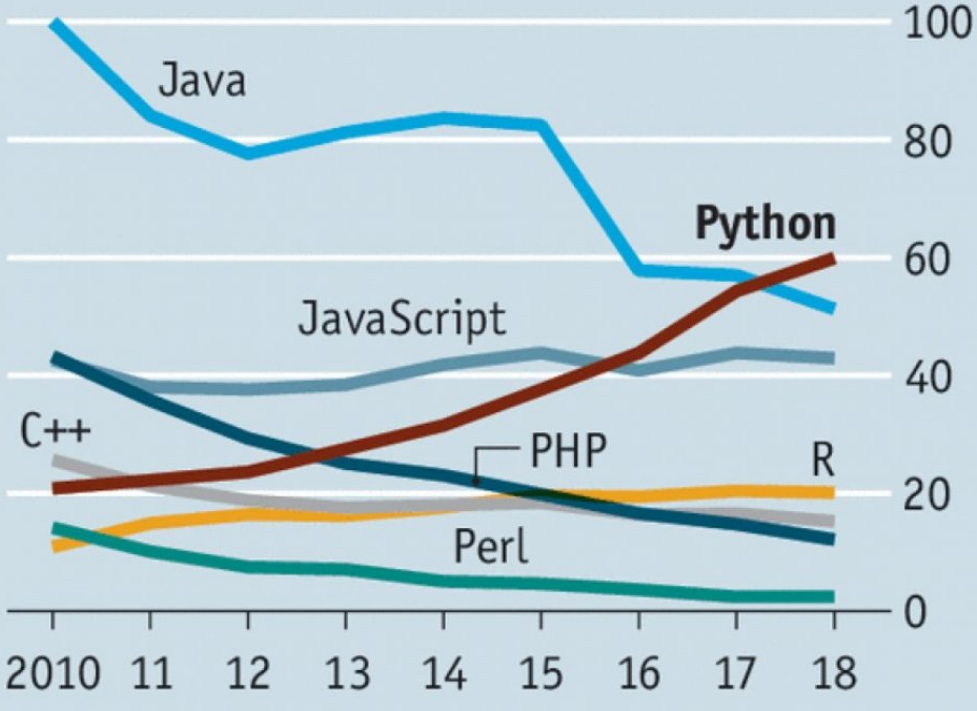
A high-level, popular, general-purpose programming language.

- High-level: closer to human languages than machine code; very readable and relatively simple syntax
- Popular: expected to become the most popular programming language (and already is by some metrics)
- General-purpose: can be used for a wide variety of applications, such as games, web apps, and data analysis

Biggus uptickus

US, Google searches for coding languages

100=highest annual traffic for any language



Source: Google Trends

Economist.com

PYTHON FOR DATA ANALYSIS

- Numerous open-source packages created and maintained by an active and growing Python community, to simplify programming for:
    - Data processing, analysis and visualisation
    - Data collection via APIs and web scraping
    - Machine learning and predictive modelling

PYTHON FOR DATA ANALYSIS

- Ability to handle larger volumes of data in a more robust, repeatable manner and with greater control than traditional spreadsheet applications such as Excel
    - Repeated operations are carried out more efficiently
    - Program logic is not hidden within the user interface

WHERE PYTHON CAN BE WRITTEN AND EXECUTED

- via the command-line interface
    - Command Prompt on Windows or Terminal on Mac / Linux
    - text-based with limited formatting of outputs
- via an IDE (Integrated Development Environment)
    - typically with features such as syntax highlighting and debugging tools
- via an interactive notebook interface
    - typically with features such formatted display of code output and the ability to combine code with other media such as text and images

JUPYTER NOTEBOOK

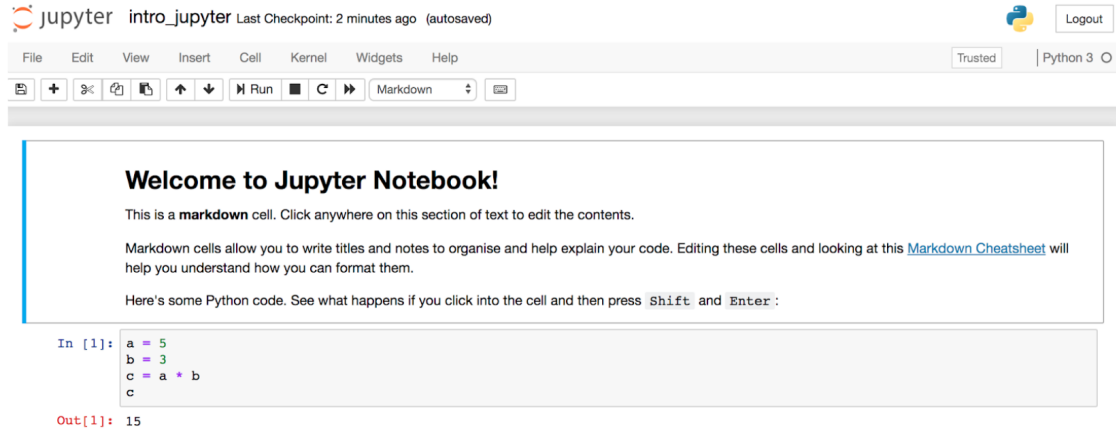
A web-based, interactive computing notebook interface:

- Create documents containing live code, visualisations and narrative text
- Embed HTML, images and videos and use interactive widgets
- Support for numerous programming languages (originally Julia, Python and R)

NOTEBOOK COMPONENTS

- A kernel is a program which runs the code cells in a notebook
    - such as our installation of Python
- A notebook is made of different types of cells:
    - Markdown cells can be used to add headings, notes and text lists
    - Code cells contain code compatible with the selected kernel
- Additional functionality and numerous extensions available, such as:
    - Slideshow creation
    - Code formatting tools

USER INTERFACE



Introduction to Jupyter Notebook

intro-jupyter-workbook.ipynb