

# CS3101

## Lecture 4: Python & Jupyter

Josh Maglione

University of Galway

# Intro

**Goal:** To get you comfortable with basic functionality of Python to help make your life easier.

# Python



- ▶ Python, a high-level programming language, has established itself as one of the most popular and versatile languages.
- ▶ Python's design philosophy revolves around **easy-to-read code**.
- ▶ This readability makes Python particularly appealing for beginners and professionals alike

# Key features of Python

1. **Easy to learn and use:** Its straightforward syntax mimics natural language, allowing you to focus on learning programming concepts rather than complex syntax.
2. **Versatile:** Used in web development, data analysis, AI, scientific computing, and more.
3. **Interpreted language:** Execute code line by line in the Python interpreter, simplifying debugging and making it ideal for quick prototyping.
4. **Extensive libraries and communities:** Rich set of libraries and frameworks that simplify tasks in various domains. Large and active communities to help address needs and fix problems.

# Vast Ecosystem of Third-Party Packages (Modules)

- ▶ Python's ecosystem includes a variety of powerful tools for different tasks.
  - ▶ **Web development:** Modules like Django and Flask.
  - ▶ **Scientific computing and data analysis:** Tools like NumPy, SciPy, pandas, and Matplotlib.
  - ▶ **Machine learning and AI:** Libraries such as TensorFlow and Scikit-learn.
- ▶ Each of these modules has a community behind it—often found on GitHub or Slack.

# Working with Python via Jupyter



- ▶ Offers an interactive environment for various programming languages, especially Python, as well as R, Julia, etc.

# How to get Jupyter

- ▶ One can install Jupyter on the machine—to do this, one needs Python.
- ▶ At least two options for free cloud-based Jupyter notebooks.
  1. **Binder** : Project Jupyter
  2. **Colab** : Google
- ▶ Binder has no strings attached, but the loadtime can be slow.
- ▶ Colab requires a Google account. Use if you want—not required!