CS 161 (Stanford, Winter 2026) Lecture 2

Pre-lecture exercises will not be collected for credit. However, you will get more out of each lecture if you do them, and they will be referenced during the lecture. We recommend writing out your answers to pre-lecture exercises before class. Pre-lecture exercises usually should not take you more than 30 minutes.

Pre-Lecture Exercises

In this pre-lecture exercise, you will get started with IPython notebooks and Python, which we will use to illustrate algorithms throughout the course. We will not ask you to write Python code in this class, but if you want to get familiar with concrete implementations of concepts we learn in the class, IPython notebooks that will be linked next to lectures will be a valuable resource.

There are a few different ways to use IPython notebooks.

1. Online, through your browser. This can be done via `jupyter.org` or `colab.research.google.com` You do not need to install any software. Throughout the course, we will provide links that directly import the IPython notebooks into Google Colab for you.
2. Offline, still through your browser. You will need to install Python 3.3 or higher and Jupyter Notebook or JupyterLab.

You will also play around with some mystery sorting algorithms written in Python!

Note that this pre-lecture exercise might take a bit longer than normal pre-lecture exercises if you are not familiar with Python.

Exercise 1

Go to `jupyter.org` or `colab.research.google.com` and get at least one of the two ways of using IPython notebooks up and running. We encourage you to install Python and Jupyter Notebook (or JupyterLab) since much of the stuff we'll be doing with them involve examining the runtime of algorithms. This may be better/more interesting if the algorithms are running on your computer, rather than in Jupyter's or Google's cloud.

1. To use IPython notebooks in the browser, go to `jupyter.org` and click "Try it in your browser." This is all you need to do. Alternately, open the `lecture2_pre.ipynb` file in Google Colab: `colab.research.google.com`
2. To install Jupyter notebooks on your computer, follow the instructions at `http://jupyter.org/install.html`.

Notes:

- You should install Python 3.3 or higher.
- Depending on how you install(ed) Python, you may need to install matplotlib separately if you do not have it already.

Exercise 2

Download the `lecture2_pre.ipynb` file from the course website and open it as a Jupyter Notebook.

Exercise 3

The first chunk of `lecture2_pre.ipynb` is just a bunch of examples of Python in action. Walk through them and get a feel for the language. If you are new to Python, you may wish to work through the tutorial linked in the notebook. **In this class, you will never need to write Python code**, so don't worry about mastering it now.

Exercise 4

Finally, the actual pre-lecture exercise. Take a look at the two Python programs `mysteryAlgorithmOne` and `mysteryAlgorithmTwo`. Both of these are sorting algorithms.

1. For both algorithms, step through what they do to the list `A = [5,3,4,1,6]` on paper.
2. Both algorithms are implementations of the same algorithm that you may have seen before in CS106b.[1] What algorithm is this?

[1] At least if you took CS106b in recent memory.