
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 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.

In this pre-lecture exercise, you will get started with Jupyter notebooks and Python, which we will use to illustrate algorithms throughout the course. There are a few different ways to use Jupyter 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.
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:** 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 Jupyter 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 actually running on your computer, rather than in Jupyter's or Google's cloud.

1. To use Jupyter 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.

If you are having difficulty, please talk to a CA during office hours or ask on Piazza.

Exercise 1.5. Download the `lecture2_pre.ipynb` file from the course website and open it as a Jupyter Notebook.

Exercise 2. 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 completely 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 from scratch**, so don't worry about mastering it now.

Exercise 3. Finally, the actual pre-lecture exercise. Take a look at the two Python programs `mysteryAlgorithmOne` and `mysteryAlgorithmTwo`. Both of these are sorting algorithms.

Part A. For both algorithms, step through what they do to the list `A = [5,3,4,1,6]` on paper.

Part B. Both algorithms are implementations of the same algorithm that you may have seen before in CS106b.¹ What algorithm is this?

¹At least, if you took CS106b in recent memory.