# COSC 410LA S25 Lab 1: Python Environment

## Introduction

Happy partial snow day! The following just guides you through installing python packages in an environment. This will be useful going forward.

## Notebooks Overview

Programming in lab will make use of Python notebooks (also called Jupyter notebooks). Python notebooks are a cell-based Python environment, meaning that your code is divided into cells that can be run in any order. The notebooks are backed by a Python kernel that maintains state between cell executions. Python notebooks are a very common programming environment for machine learning and data science. The cell-based execution and in-place plotting makes data exploration particularly convenient.

## Local Environment

### Install

You will need Python 3 and a bunch of Python libraries. The simplest way to install these is to download and install conda via Miniforge.

## Create the `ml` Environment

Next, make sure you're in the `lab01` directory and run the following command. It will create a new `conda` environment containing libraries you will need for this class:

```
$ conda env create -f environment.yml
```

Next, activate the new environment:

```
$ conda activate ml
```

## Start Jupyter

You're almost there! You just need to register the `ml` conda environment to Jupyter.

```
$ python3 -m ipykernel install --user --name=ml
```

You have to select the kernel in the "Kernel > Change kernel…" menu in Jupyter every time you open a notebook.

That's it! You can now start Jupyter like this:

```
$ jupyter lab
```

This should open up your browser to Jupyter lab with the contents of the current directory. If your browser does not open automatically, visit localhost:8888.

Every time you want to work on materials for this class, you will need to open a Terminal, and run:

```
$ cd PATH # Navigate to your project folder
$ conda activate ml
$ jupyter lab
```

## Acknowledgments

The instructions for setting up a local environment and accompanying environment specification (`environment.yml`) are adapted from the github repo (link) for Hands-on Machine Learning with Scikit-Learn, Keras and TensorFlow (3rd edition).