# CST8504 Presentation 1: Learning Python, Numpy, Pandas, Matplotlib

## Overview

Programming in Python for Artificial Intelligence is heavily reliant on Python libraries dedicated to various Artificial Intelligence techniques. There is an distinct learning curve when it comes to effectively using the data-processing and visualization libraries for AI. This activity is a group effort, focused on identifying and describing the challenges you and your classmates have encountered while learning Python and the associated libraries, as well as providing advice for newcomers on how to rise to the challenges, or how to avoid pitfalls.

## Activity

Working in groups of 3-4 members, create an educational presentation (7 to 10 minutes long) on the subject of learning the Python language and programming with Python libraries: Numpy, Pandas, Matplotlib. Video format or live presentation format are both acceptable. In lab class, we will view the presentations as a group, and each student will participate in the grading by assigning a score to each presentation.

## Content Guidelines

The presentation or video should be based the actual experience of the team members, and dedicated to using that experience to help a future student of Python learn and master Python, Numpy, Pandas, and Matplotlib for Artificial Intelligence purposes. While adhering to the 7-10 minute time boundaries, you are free to design your presentation to give a broad overview of helpful information, or alternatively, your team can concentrate on a smaller number of topics that you feel are most important to address to ensure learning success for students.

Example appropriate topics (not limited to these):

* Python Language, syntax, etc
  + How is it different?
  + What makes it difficult?
  + What makes it easy?
* Python Lists
  + Indexing (negative?) and steps
  + slicing
* Numpy
  + Why Numpy?
  + Differences between arrays and lists
* Pandas
  + Differences between Series, DataFrames, and Numpy arrays
  + Shapes and sizes
  + Benefits of Pandas compared to Numpy
* Matplotlib
  + Importance of visualization
  + Basics of plotting with Maplotlib
* Advice for classmates
  + Tips and Tricks for success
  + Potential pitfalls to avoid while learning Python
  + "Think of it this way…"
  + "Avoid thinking of it this way…"

## Methodology

It is important to decide early on strategy and an outline of what the content of your presentation will be. Begin by meeting as a group to take inventory of each group member's experiences and thoughts on learning Python and the libraries. Design the content of your presentation to be representative of your group. Try to take advantage of your student's-eye-view. The possibilities are open, but here are some examples strategies your group might choose for a basis of your presentation:

* If one or more members of your group is struggling with Python or one of the concepts of using the libraries, and one or more members of your group feels quite confident, then that is a golden opportunity to make your presentation about how the group members worked with each other on overcoming some of the struggles. The confident members can bring to the table advice, studying strategies, tutoring attempts, etc, and the struggling members can bring to the table verification of what seems to work well, and what doesn't seem to work as well, and why.
* If all of your group members are confident and learning Python for AI is going well for everyone, then that is a golden opportunity to pick one or two of the really difficult topics relating to Python or the libraries, and explain it in more detail than you have so far. Why is it difficult? Why is it important? How can an understanding of the topic make you a better AI software developer?
* If all of your group members are struggling with Python or any of the libraries, then that is a golden opportunity to make a presentation about the details of the struggles that students might face when trying to learn Python for AI. Compare notes with your team-mates on what are the most daunting concepts, and why they are daunting compared to what you are used to.

## Delivery of Presentation

Each group member must do some speaking in the video or during the live presentation, depending on which of those two formats you have chosen. While you are speaking (or being recorded for video) you are representing, from your own point of view, your contribution to the tutorial and advice your team is providing to future students.

We will watch all the presentations together in a dedicated Lecture or Lab Period, and each student will assign a peer-review grade to each group.

## Grading

Your grade for the presentation will be calculated as a combination of the average peer-assigned grade, and the professor's assigned grade. The professor’s grading will be based on how well you and your team followed (or enhanced) the above Content Guidelines and Methodology.