**Review Project**

This past year, we had to create a program to schedule all of the students in Raleigh Charter for Phoenix Fest. For those who are new to the school, Phoenix Fest is our annual academic and cultural fest, and we have over 100+ upperclassmen present various presentations and demonstrations.

There is quite a few nuances to the program, but here are actually some of the things we had to consider when developing it. The tasks will increase in order of difficulty, starting out with (hopfeully) rudimentary stuff before a comprehensive recap of OOP!

**Note: We understand if these exercises seem really basic at first. Our goal is warm you back up to coding as some of you might have done it for a while. Remember, everyone is at different places in their journey, so be considerate!**

**What you need to do:**

1. To get your feet back into the Python waters, copy and paste this list below:

| students = ["Fillip", "Arnav", "Tushar", "Gabe", "Avery", "Luke", "Ian"] |
| --- |

* 1. I *told* you this is a list, but how can you get Python to verify it for you?
  2. Let’s say I wanted to sort this alphabetically. Which list method makes this process incredibly simple?
  3. Print out every single name in this list using a loop
     1. Now, do the same thing in one line with [list comprehension](https://docs.google.com/presentation/d/1Bwi9gTM4dEstVxQAUh6Qy5LINeXgl0UfRWhBJpGvjHg/edit?usp=sharing)
  4. Let’s say that I wanted to randomize the list again, how would I do that? (Remember our [libraries & modules](https://docs.google.com/presentation/d/1dQpYqGSECZ4q2U4ujkUIv_9k1zFCUe8FhlCIuQ37M1Q/edit?usp=sharing))
  5. Check every name in the list; if it starts with the letter A, tell them that they are cool! (try to use list comprehension here if you want a challenge!)
  6. Create a function that does the following
     1. Ask them for a name
     2. If the name is in the list, simply return the index the name is at
     3. If the name is not on the list, ask them if they would like to add the name to the list; if they say yes, add it and return the new list
     4. Assume all inputs are valid & correct (don’t worry about error handling)

**Data Set:** Click on [this](https://drive.google.com/drive/folders/1pKJ8FfhschhKyGHv-gtqb_zFbhrgVvxQ?usp=sharing) link

This is a sample of some data from a few years ago. There is a slideshow that explains all of the files that are in the folder.

* Here you can choose the difficulty of your project:
  + What most programmers get a lot of the time is the end result, nothing else. If you would like that, just continue reading on this page.
  + If you would like to have a little bit more explanation in terms of the overview of the steps, you can go read the end result explanation + look at the “steps” on the next page.

End result:

Design and write a program that assigns students to Phoenix Fest Presentations

- Students signup will include first name, last name, email address, up to 5 choices for each program slot. Total of 5 program slots.

- Presentation information will include presentation name, presentation category, room number, max capacity, supervisor.

- Each student must be assigned to a presentation for each slot.

- Presenters will not be assigned to any presentations.

\*\*\* Develop criteria for assignment based on preferences.

\*\*\* Come up with a way to measure how well your program works in assigning based on your preferences.

Essentially, based on the preferences of all the students, come up with the best way to put the students into their highest-rated classes without going over the maximum capacity and without having too few people in each class as well.

Now, this is where some of the first few steps are. If you do not want to see somewhat of a roadmap, that is completely fine, just **don't read this page**.

1. Well, first we need to start working with the files. There are a few ways to do it, but usually, using python, the files would be imported and read with some module. We are given .csv files
   1. Read up on the file type or ask Fillip about it
      1. Do you by any chance have an idea of a module that you can use to read these files? There are many answers to this question
2. Well, we are working with quite a few files here, but what is known is that there are files that refer to “students” where they have their preferences and such, as well as files that refer to “classes”
   1. We can go from this: we learned about classes last year. They are going to be very useful in this program.
      1. Create 2 classes
         1. A “Student” class, that contains all the necessary information about the student
         2. And a “Class” class (maybe make a better name) that contains all the necessary information about a particular class.
3. Now that we have 2 classes, we need to populate them. Can you find a way to have all the students in one place and then just have different copies of that class be populated via a loop? Essentially what I am telling you to do is to have a location where you can access the different students by accessing a different copy of that same class. Same thing with the “class” class.