Introduction

Today in studio, you will complete several tasks that will help you get set up to program this term in ENGR 103. You should be prepared to engage with your classmates for the entire studio time. The main goals for today are:

1. To write shoe tying algorithms in English rather than in code.
2. To give feedback on the algorithms.
3. To improve your precision for writing algorithms in English.
4. To ensure you can access and run Python.

The expectations for you today are:

1. Stay engaged with the material for the entire time (take a quick stretch break as needed).
2. Focus more of what you will learn through this process rather than on finishing in time.
3. Remember the things you learned about teamwork, communication and listening from ENGR 199 in Fall and Winter (if you took them).
4. Be respectful of your classmates' input and strive to be part of an inclusive culture in this learning space.

The TAs will guide you through today's work. Please follow along with the instructions below and fill out the bolded sections in this document. You will also need to access other documents as indicated. Feel free to ask lots of questions if anything is unclear. An evaluation rubric for today's studio is included below.

You will submit a .pdf of your completed work at the end of the studio session. **Action items are written in bold text.** The results of each should be at least acknowledged in your submission.

Thank you for your hard work and engagement. Be sure you tell a TA that you are ready to leave in order to receive credit for today's studio. If you experience technical difficulties and leave studio early, you must e-mail your GTA explaining the situation. See the Office Hours tab in the Canvas course for contact information.

Part 1 (~15 min)

As a group of three to five students:

1. **Write a complete set of instructions in English explaining how to tie a shoe**. The instructions should presume no former knowledge of the subject (for example, avoid using terms like "make some rabbit ears"). Write your instructions with the goal in mind that somebody else can read them and exactly replicate your shoe-tying process.

2. **Upload your algorithm to the class's shared Google sheet** linked below, into the column labeled "Algorithm Text" and include your group member names in the column labeled "Group Member Names"
    a. https://docs.google.com/spreadsheets/d/1S47-mbidP8qRT9W65HmW3mc5443FynEhBMVRfKcwYMs/edit?usp=sharing

Part 2 (~45 min)

Individually:

1. Read an algorithm from another group
2. Imagine how you would perform the instructions in the algorithm. (Alternatively, use a shoe to help.)
    a. Is the algorithm correct? Will it work to tie the shoelaces?
    b. Remember to focus on how detailed the algorithm is (precision). Are there any instructions which need clarification? Are there additional details which would improve your ability to follow the instructions?
3. **Write detailed feedback on how the algorithm could be improved.**

As a group:

4. Rejoin with your group and discuss your feedback concerning others' algorithms. You need not be comparing the same algorithm in order to see similarities and differences. **Answer the following questions:**
    a. **What were the similarities among your feedback?**

    b. **What were the main differences?**

5. Now choose one algorithm to provide feedback on as a group. Please try to pick one that is not already receiving feedback (pick one to provide feedback on and then write "yes" in the column titled "Claimed for Feedback?"). **Write detailed feedback on how the algorithm could be improved in the column title "Feedback".** Only one person must type, but everyone should be included in the discussion.
    a. Keep your feedback respectful. Specifically, feedback should be neutral or positive in tone. One way to achieve this is to avoid using "you" in comments. For example: "your first sentence is not clear" vs "the addition of which color lace to grab first would improve the first sentence."
    b. Add positive comments when appropriate.

6. **As a group, try to rewrite the algorithm in the next column called Rewritten Algorithm.**

7. The last ~15 minutes, the TAs will guide a group discussion on what you learned about writing algorithms that can be followed by computers, including humans. They will also connect this exercise to the first homework assignment.

Part 3: Set Up Pycharm (~45 min)

Finally, for all the coding in studios and for assignments, we will be using python. There are many available IDEs and setups for creating and running python code, we will use Pycharm for this class. Pycharm is a free IDE that allows you to write and run python projects, and even integrate version control if you like (version control not required for this class).

Follow the directions outlined below for installing Pycharm.

Deliverables: A screenshot of your terminal outputs to be submitted to Canvas

Install PyCharm

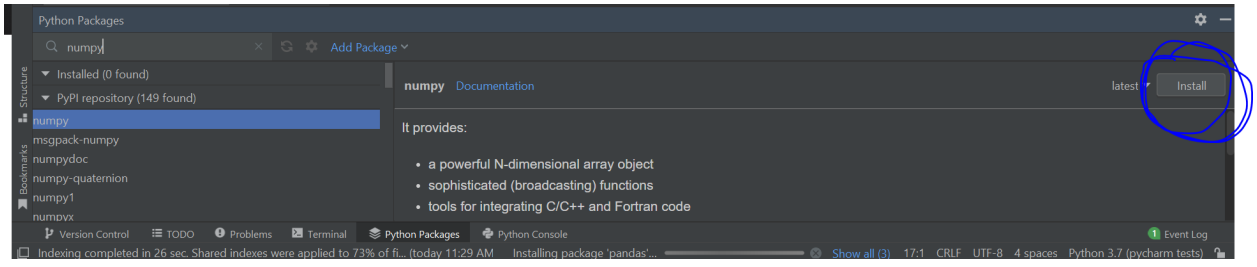
Begin here: https://www.jetbrains.com/pycharm/download

1. Download Community free version
2. Open pycharm .exe file
3. Follow directions in the pop up to locally install
    a. Additional requirements and instructions can be found here: https://www.jetbrains.com/help/pycharm/installation-guide.html#silent

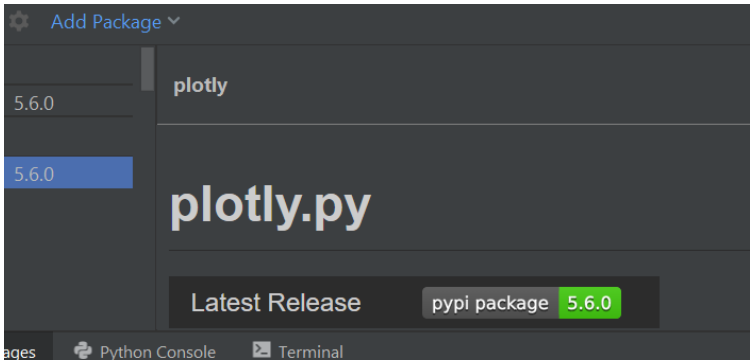
Once you have installed Pycharm, you will follow the instructions to run an example script. Additional references can be found here:
https://www.jetbrains.com/help/pycharm/quick-start-guide.html

Install Packages

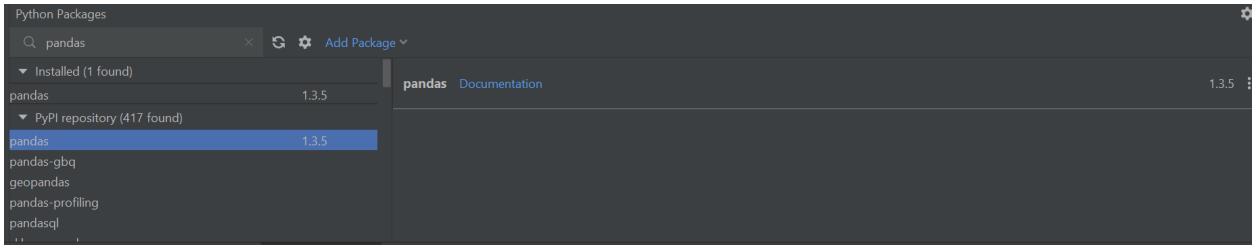
1. If you toggle one tab over to Python Packages, you can add and delete any packages that your code is dependent on. Use the search bar to search the package and click install. Try installing numpy, as seen below.



2. After installing numpy, also install plotly. We will use this in our future assignments:



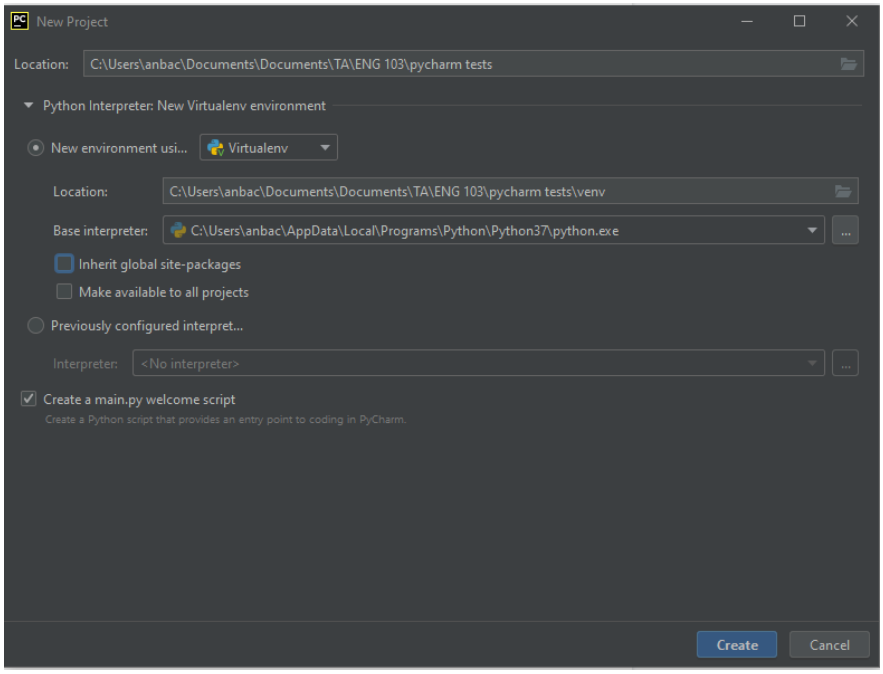
3. Next, install “pandas” as plotly uses pandas for some functions



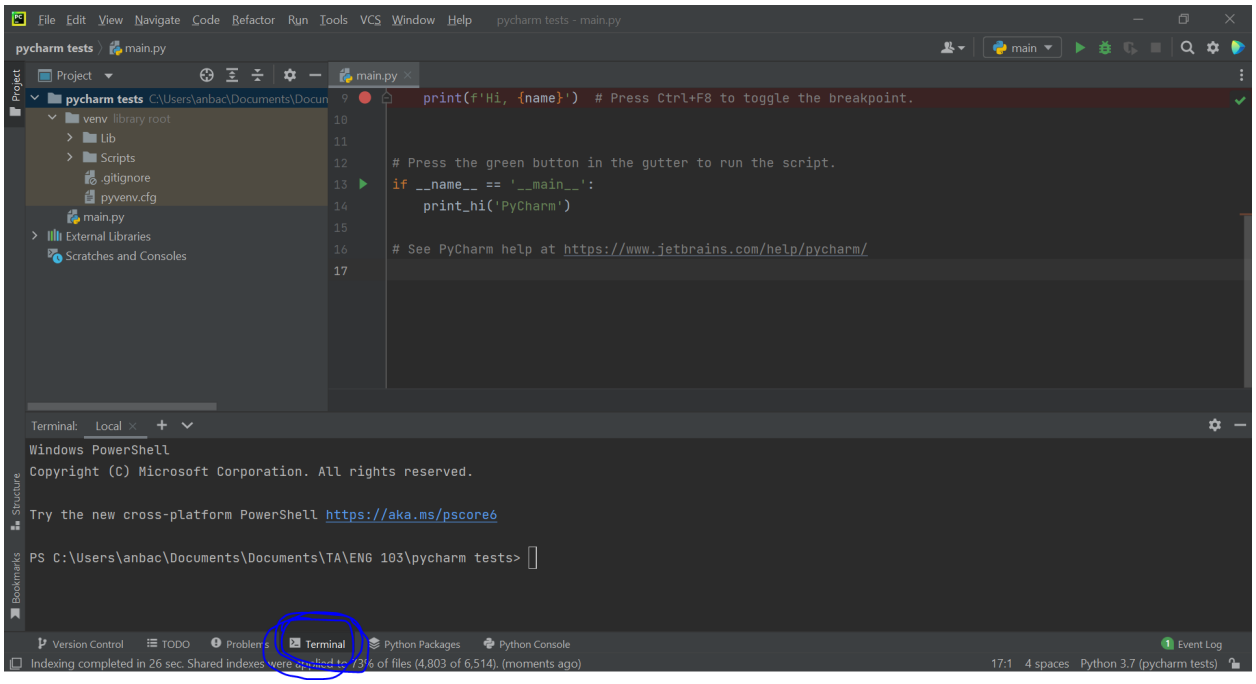
4. Finally, install “matplotlib”

Run an Example Script

Create new project (call is whatever you like, maybe Studio 1 ENG 103):

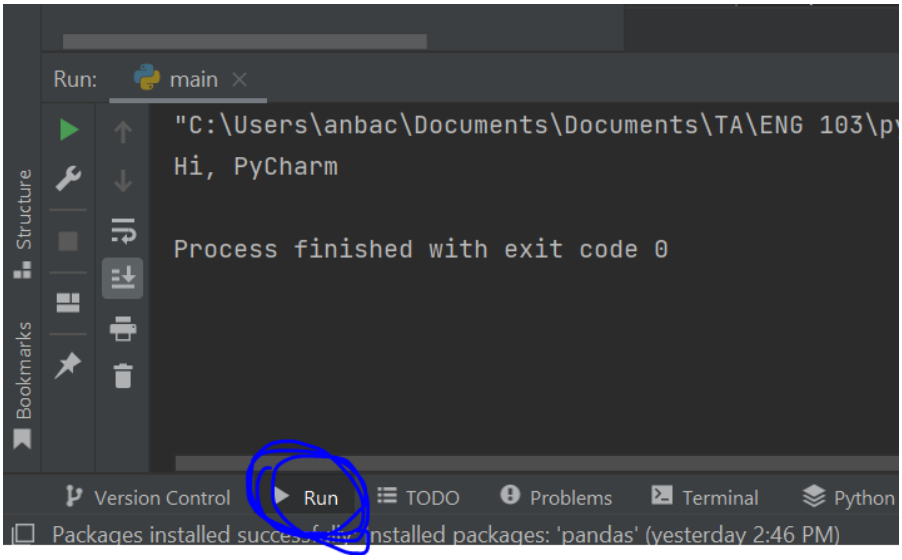


An example script will open, which will print ``Hi, Pycharm”
To run, click on the terminal tab on the bottom menu

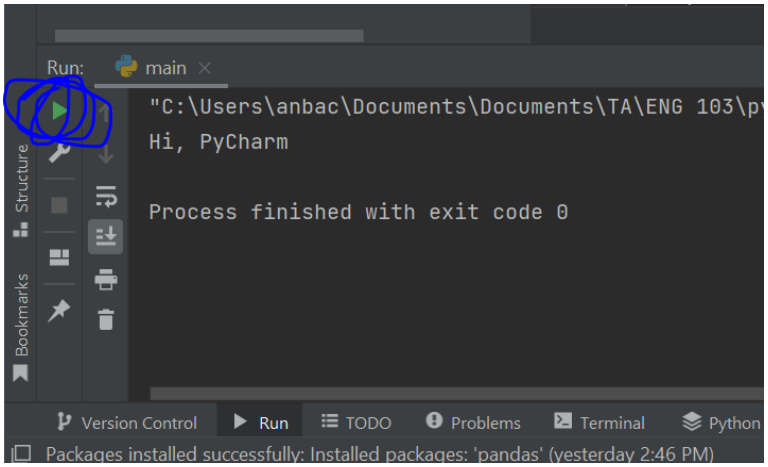


- In the terminal, type:
  - `python .\main.py`
- Alternatively, open the Run tab
  - Click the green play button by the main function

- You can then use the Run tab on the bottom



- Hit the play button to run your script



  - If you want to change the name the script outputs, go to line 14 and replace Pycharm with whatever you like, but remember to keep the quotation marks. For example:
    - `print_hi('ENG 103 Class')`

Edit and Run a Script

Next, you will open and run a custom script for this studio.

1. Download the eng103_studio1.py script from Canvas
   a. Save it to the project folder you just created
2. Go to the File menu in Pycharm and scroll to Open
   a. Navigate to your project folder and open the eng103_studio1.py file

3. Open eng103_studio1.py and change the variable names to be your name, your favorite animal, and your goals for the class
    a. Additional instructions are in the comments of the file
4. **DELIVERABLE: Screenshot your terminal outputs and submit this picture to Canvas**

Example screenshot to turn in: