CS105 Lab introduction

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Lab work and grading procedure

- Lab attendance is required.
- Student are highly encouraged to team up to finish the lab work(two students a group, no more than 2).
- You could team up with the students in different session for the regular lab. But you two need both attend the same lab session.
- There are two options for gaining scores of your lab work.
  - Directly demo the work to us.
  - Only submitting files for grading.
  - Notice: Even you choose to demo option, you still need to submit you file online before the due day.

Demo

- Demo:
  - Each group need to sign up a time-slot for demo each week before the due. You can also demo during the lab time (the due day is on Tuesday. But for fairness, you can’t demo last week’s lab on the tuesday’s lab).
  - During demo, both group members need to show up and contribute to answer questions and explanations.
  - You still need to submit your ipynb file and your pdf file online before the due date. Choose the right option.
  - Scores are totally dependent on your demo. You can get feedback immediately.

Grading

- Submit for grading: submit your code and you pdf file before the due date.
  - Since the demo time-slots are limited, if those time-slots do not fit your own schedule, submitting the codes for grading would also be a convenient way.

Office hour for answering questions

- Friday 7:00 p.m. - 8:00 p.m.
- https://ucr.zoom.us/j/91374039103?pwd=R0xmRTIIMTcvVXpabjhITW4xeHBiQT09
  - (Meeting ID: 913 7403 9103 Passcode: 345567)
- If there are not any students asking questions, you can demo as well.

Download and Install the anaconda

1. Download and Install the anaconda

   Download: https://www.anaconda.com/products/individual

2. Install (for Windows): https://www.datacamp.com/community/tutorials/installing-anaconda-windows
3. Install (for Mac): “Anaconda_Installation_Guide.pdf” is in the folder “labs” on elearn.

Python

- Python is used a lot in data analysis, machine learning, AI, etc.
- Flexible, without complicated syntax.
  - No declarations of variables, parameters, functions, etc.
  - Does not require a semicolon at the end of each statement. The end of a line marks the end of the statement.
  - Whitespace indentation is important. A logical block of statements should all have the same indentation.
- **The python packages(libraries):** there are a variety of packages that contain useful data analysis functions and visualization functions.
- In our labs, you need to learn to choose the functions and directly use those functions for your objectives instead of writing the code from scratch.

Some useful Packages for Data Analysis

- **Numpy:** an array processing package. Array is similar to the matrix in math. You can use the functions in numpy to do different array computations.
- **Pandas:** very powerful for data analysis. It provides functions to read, write and manipulate data and is flexible at dealing with relational dataset.
- **Matplotlib:** great for data visualization.
- **SCIPY**: more mathematical and statistical. It provides functions for statistics, linear algebra, etc.

(“Package Tutorial.ipynb” is in the folder labs on the elearn.)

Jupyter notebook has already installed most main packages. To use the functions from certain package, you just need to import those functions first.

Resources for learning python

- **The lectures and recording (prepared by Seyedehmaryam Shahcheraghi):** https://drive.google.com/drive/folders/1nprJzDEgqsb8WoObOYdJxBV3FCjLK8rR?usp=sharing
- **Tutorial:** https://docs.python.org/3/tutorial/
- **Also try Code Academy:** https://www.codecademy.com/learn/learn-python-3

Hints of useful functions for Lab1

- Question 1: pandas.DataFrame.set_index().sort_index()
- Question 2: pandas.Series.apply(); pandas.Series.value_counts(); and visualization functions, check “examples.ipynb”.
- Question 3: Similar to the question 2, but has 10 different digits.
- Question 4: Similar to the question 2 and question 3.

More examples about the functions please refer to the “Lab1 Examples.ipynb”.