Lab 1

Setting up environment

Anaconda

To begin, you need to set up the environment with python. We will use Anaconda, an environment manager for it.

[MAC]: https://www.datacamp.com/community/tutorials/installing-anaconda-mac-os-x

[WINDOWS]:
https://medium.com/@GalarnykMichael/install-python-on-windows-anaconda-c63c7c3d1444

Unix

We will use Unix commands for Navigating directories, installing packages and libraries, copying and checking files, etc.

[MAC]: MAC comes with a Unix shell, so no need to install anything. (A tutorial for basic commands: https://faculty1.coloradocollege.edu/~sburns/UnixTutorial/unix1.html

[WINDOWS]: To use unix commands on Windows, follow this
https://www.howtogeek.com/249966/how-to-install-and-use-the-linux-bash-shell-on-windows-10/

Git

Git is a version control system that is often used to record changes to a file or set of files over time so that you can recall specific versions later.

To set up Git on you computer: https://git-scm.com/downloads
To learn Github usage:
https://docs.github.com/en/github/getting-started-with-github/set-up-git

Jupyter notebook

We will use Jupyter notebooks for our exercises in this course. Jupyter offers both text and coding elements for machine learning and data analysis purposes.

To know how to use Jupyter:
https://www.datacamp.com/community/tutorials/tutorial-jupyter-notebook

Note 1:
We recommend using Python3 for all your installation of packages. Ensure you are using Python3, as Python2 is no longer supported.

Note 2:
We recommend using a virtual conda anvironment for this class using :
`conda create -n <your_environment_name> python=3.7`

to activate the environment: `conda activate <your_environment_name>`

* Follow this for more details on virtual environment:
https://docs.conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html

Exercises

Instructions:

- Lab 1 consists of 10 questions.
- In session 1, you will work on the first 5 problems, and in session 2, you will work on the last 5 problems.
- Once completed, you will submit your exercises as jupyter notebooks (as a .ipynb file) through e-mail at 'tahiya.chowdhury@rutgers.edu' for grading.
- In the e-mail, use subject line: **CPSML: Week X**, where X represents the week.
- Both the jupyter notebook and e-mail should contain your name in English.

1. Print 'Hello World'

- Run `print("Machine Learning")` in a jupyter cell.
- Replace `'Machine Learning'` with `'Hello World'`.
- Now declare a variable `my_text` with some text in the value. Print the variable.

2. Declare 2 variables ‘x’ and ‘y’ with values ‘20’ and ‘4’.

- Add them (`x+y`). Print the result.
- Subtract them (`x-y`). Print the result.
- Multiply them (`x*y`). Print the result.
- Exponentiate x with power of 2 and and y with power of 3. Print the result.

3. Declare a list of 5 animals: ['cat', 'dog', 'monkey', 'bird', 'turtle']

- Print the elements in the list using a for loop.

4. Create a python list with list elements from 1 to 15

- Print all list elements.
- Print elements from 5th to last position.
- Print the last element.
- Print the squared value of every 3rd of the elements.

5. Consider the string: ‘`www.google.com`’.

- Calculate the length of the string and print it.

6. Consider the string: ‘www.google.com’.

- Count the number of times each character appears (character frequency) in the string. Print in this format { 'o': 3, ...}.

7. Consider two strings ‘Bill’ and ‘Fox’.

- Create a single string from the two given strings, separated by a space and swap the first two characters of each string. Print the result.

8. Consider the string ‘Caterpiller’.

- remove all occurence of ‘er’ from the string. Print the result.
- remove the n-th index character from the original string, where n = 3, 6, 9. print the result in all 3 cases.

9. Consider this comma seperated sequence of words: ['breakfast', 'towel', 'noon', 'magical', 'profession']

- take this sequence of words as input and print the length of the longest word.

10. Consider the sentence ‘`the quick brown fox jumps over the lazy dog`’

- Count the occurrences of each word in the sentence. Print the result.