Instructions for Homework 1

In this homework, you will design and implement differentially private algorithms for answering **epicenter queries** on a dataset containing locations of tweets. You are given two files Homework1.ipynb (which includes all homework details) and twitter.npy (dataset)

DUE: Sep 17, 11:59 pm

WHAT TO SUBMIT: You should turn in your solution file (Homework1_YOURNETID.ipynb). Please complete all parts 1(a-b), 2(a-b), 3(a-b), 4(a-b), 5(a-b). Pay attention to the 'TODO's.

HOW TO SUBMIT: Submit the file using [WebSubmit](). Choose your file to upload, click on the course number (compsci590.1), click on folder (hw1), click on SUBMIT. Wait for it to say Submission Complete.

HOW TO OPEN Homework1.ipynb
(Ref: [https://jupyter.readthedocs.io/en/latest/install.html#new-to-python-and-jupyter]())

For new users, we **highly recommend** installing Anaconda. Anaconda conveniently installs Python, the Jupyter Notebook, and other commonly used packages for scientific computing and data science.
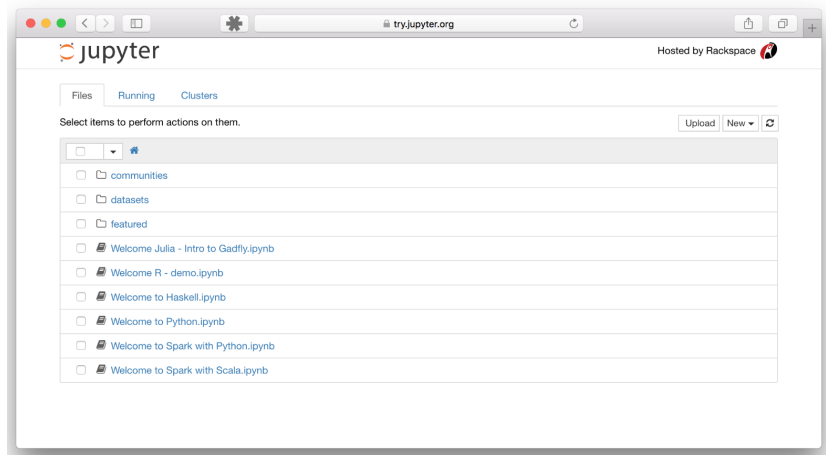
Use the following installation steps:

1. Download and install Anaconda
   (Ref: [https://conda.io/docs/user-guide/install/index.html]())
2. Run the notebook after installing Anaconda
   (Ref: [https://jupyter.readthedocs.io/en/latest/running.html#running]())
   a. Start the notebook server from the command line:

   ```
   $ jupyter notebook
   [I 08:58:24.417 NotebookApp] Serving notebooks from local directory: /Users/catherine
   [I 08:58:24.417 NotebookApp] 0 active kernels
   [I 08:58:24.417 NotebookApp] The Jupyter Notebook is running at: http://localhost:8888/
   [I 08:58:24.417 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to
   ```

   b. You should see the notebook open in your browser. When the notebook opens in your browser, you will see the Notebook Dashboard, which will show a list of the notebooks, files, and subdirectories in the directory where the notebook server was started. Most of the time, you will wish to start a notebook server in the highest level directory containing notebooks. Often this will be your

home directory.

c. Place Homework1.ipynb and twitter.npy in the same directory, e.g. your home directory. Then you can open Homework1.ipynb from your browser directly.

3. If you install Anaconda, you should have all the necessary python packages to complete your assignment. If you need to install packages, you may follow the instructions here: https://conda.io/docs/user-guide/tasks/manage-pkgs.html