Homework 1—ECE590–001—**Due: 29 Jan 2020**

1/15/2020

1. Install Docker on your local machine. Docker is available for Windows, Mac, and Linux. You have succeeded when the following works.
2. Run your first Docker commands:
   (a)
   ```
   docker pull continuumio/anaconda3 # pull the docker image from the container
       registry
   docker run -i -t continuumio/anaconda3 /bin/bash # run the image
       interactively
   # you will not have a root prompt within an anaconda3 containers
   exit # exits the terminal session (/bin/bash) and closes terminates the
       container
   ```
   (b) Read more https://hub.docker.com/r/continuumio/anaconda3. *try the last command to get an interactive jupyter notebook bridged from docker to your local machine*
3. Install spinningup and its dependencies by docker container and issuing commands. It is installed correctly when you can run the algorithms provided.
   (a) Start by experimenting:
   ```
   docker run -i -t continuumio/anaconda3 /bin/bash
   git clone https://github.com/openai/spinningup # !!! these changes are not
       persistent
   pip install spinningup # use pip on local copy to install spinning up
   ```
   (b) The dependencies will not be met by the `pip` command above. But you can pip these requirements into the base anaconda environment. The requirements can be found: https://github.com/openai/spinningup/blob/master/setup.py and the command would be something like
   ```
   pip install ``req1'' ... ``reqN''
   ```
   (c) The last pip command will not succeed (i.e. run to completion without errors). Read these errors and try to fix them. *The errors are due the fact that you have minimal development environment within the Docker container, you need to install more software and libraries, in particular, you likely need c/c++ compilers to support certain requirements that were within setup.py.* Figure out what these are and write them down. Additionally, how did you install them? *Hint:* `apt install` *is the package management system in Debian and can install most things.*
   ```
   apt install emacs # installs emacs text editor
   apt install g++ gcc # installs gnu c++ and c compilers
   ```
   (d) Run something from Spinning Up:
   ```
   python spinup/examples/bench_ppo_cartpole.py
   ```

4. From github (you will need to establish a github account), Fork `ece590hineman` to a copy of the repository in your own name space. Clone a copy of the repo from your name space (you can version control your work this way). **((edit)): You may also use** `gitlab.com`**. Essentially, what I need is way for you to share code and version control it.**

5. So far we have executed docker from an image and editted it, we would now like to build an image locally from a dockerfile that includes all the dependencies we have for spinning up in persistent and repeatable way. There is already a directory in `ece590hineman/homework/1/solutions` that contains a skeleton dockerfile. Edit this file to install spinning up and its dependencies. Show that you've succeed by screening shotting

   ```
   python spinup/examples/bench_ppo_cartpole.py
   ```

   You'll use what you learned from the last exercise to complete this.