Homework 1—ECE590–001

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 `spring2019ECE590hineman` 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).

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 `spring2019ECE590hineman/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.