Python Jupyter Lab Development Environment Setup Guide

1. Update Oh My ZSH by running the following command: **`omz update.`** Also, make sure to update Ubuntu by running the following commands:
    a. **`sudo apt update`**
    b. **`sudo apt -y dist-upgrade`**
    c. **`sudo apt install –-fix-missing –-fix-broken`**

2. Change into the directory of the Github repo if it is on your machine. If not, clone the repo then change directories into the Github repo.

3. Once in the Github repo, check out your individual branch by running the following command: **`git checkout <your-branch-name>`**

4. Ensure you have the latest changes pulled from your branch by running the following command: **`git pull origin <your-branch-name>`**

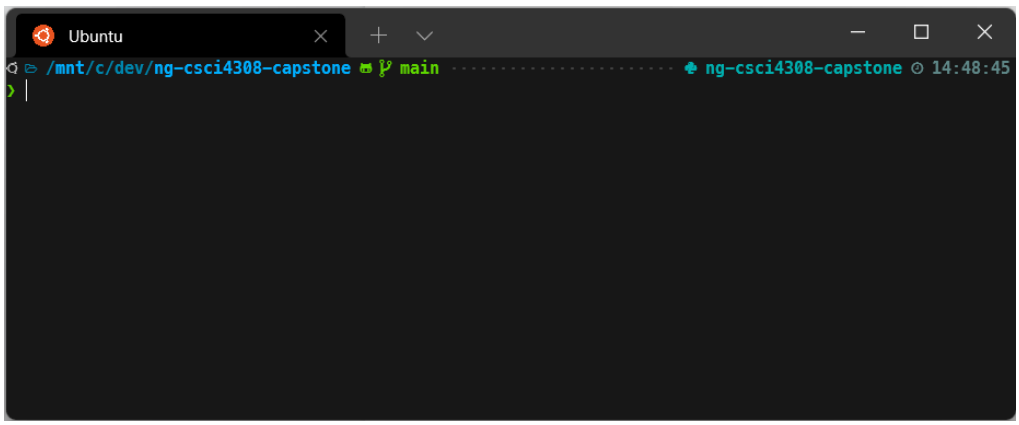
5. If you haven't done so already, git will have you set up a personal access token because traditional passwords are now deprecated. Instructions for setting up a personal access token can be found here.

6. Install the python 3 virtual environment and latex google cirq dependencies by running the following command with **`apt.`**
    a. **`sudo apt install python3-venv texlive-latex-base latexmk`**

7. Create the python 3 virtual environment by running the following command:
    a. **`python3 -m venv env`**

    b. If you run the **`ls`** command, you should now see a folder in the Github repo called **`env`**

8. Activate the Python 3 virtual environment shell by running the following command:
    a. **`source env/bin/activate`**
    b. If this step works, you will see the right side of your shell prompt change to a python shell like this:



9. Once your Python shell is active, install the project dependencies and libraries by running the following command:
    a. **`python3 -m pip install -r requirements.txt`**
    b. This can take a while; just let it run to completion.

10. Generate a jupyter lab config file by running the following command:
    a. **`jupyter lab --generate-config.`** This file will be generated in the following directory: **`~/.jupyter/jupyter_lab_config.py`**

11. Open the jupyter lab config file with vim or a text editor, uncomment line 1004, and change it the following:
    a. **`c.ServerApp.use_redirect_file = False`**
    b. Since this is a python config file, watch the indents, there should be no indent. If there is, you'll get an error message when activating jupyter lab.

12. Open Jupyter Lab by running the following command from within the Github repo.
    a. **`jupyter lab`**
    b. Your internet browser should open automatically.

13. Ensure that you can import the different libraries by starting a new notebook and adding import statements for the various libraries like cirq, qiskit, sci-kit learn, Keras, etc. Look in the requirments.txt file for a complete list of the install libraries.

14. So long as you can import all the libraries, your development environment is good to go.

15. You can also ensure that google cirq is working following step 5 from this link.

If you get through all these steps without issues, your development environment is ready. Now all you have to do to work on your branch are the following steps:

1. Start Ubuntu
2. **`cd`** into the capstone GitHub repo.
3. Run **`source env/bin/activate`**
4. Run **jupyter lab**
5. Profit

Always make sure that you are working on your individual git branch. When you finish your work for the day, push your changes to your branch by running:
`git push origin <your-branch-name>`

When it comes to branch merging and pruning, we'll just do it as a group and work through any merge conflicts together.