Using the Cavendish JupyterHub

PyCav Project

August 2016

1 What is JupyterHub?

First of all, Jupyter[1] is a web application where one can program in languages, such as Python, inside their browser.

JupyterHub[2] creates a server which allows users to have their own separate Jupyter installations, without having to install anything locally.

The Cavendish JupyterHub allows you to program in Python, run shell commands, as well as having a rudimentary file system - so you don't lose your work.

Don't worry if you don't know what any of these are, it is a simple system and this document will help you get started.

2 Getting Started

2.1 Logging In

To log in, navigate to the Cavendish JupyterHub server. There you will be presented with the following login screen:

Click the raven sign in button. Once you log in you will be redirected to this screen,

Click the 'Start my Server' button to continue to your Jupyter installation.

2.2 Landing Page

When you start your server, you will be presented with the following page. This is your Jupyter page.

[1] `http://http://jupyter.org/`
[2] `https://jupyterhub.readthedocs.io/en/latest/`

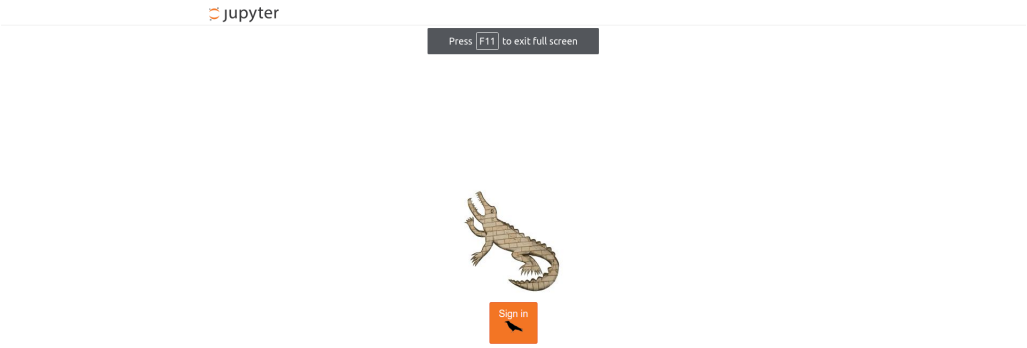

Figure 1: The login screen

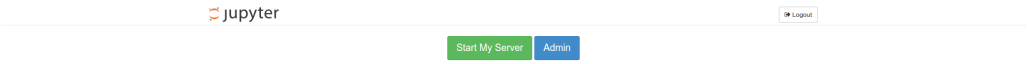

Figure 2: When one logs in, this page is displayed. Starting the server will start a Jupyter server and deliver it to you.

The demos folder contains some of the physics demonstrations that you will see in lectures. The feedback folder will contain the feedback you obtain from your assignments.

The server is a Linux installation. It has a filesystem that you can use.

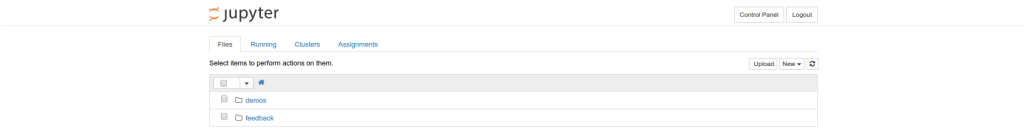

Figure 3: When you start the server it will take you to the work directory.

2.3 Creating a notebook

To get started with Notebooks, click the 'New' button on the right hand side of the page. Under *Notebooks*, select *Python3*, this will create a new Python3 notebook titled 'Untitled'.

Figure 4: If you installed Jupyter locally, you may have some more kernels to select from.

This will open a new notebook for you to use.

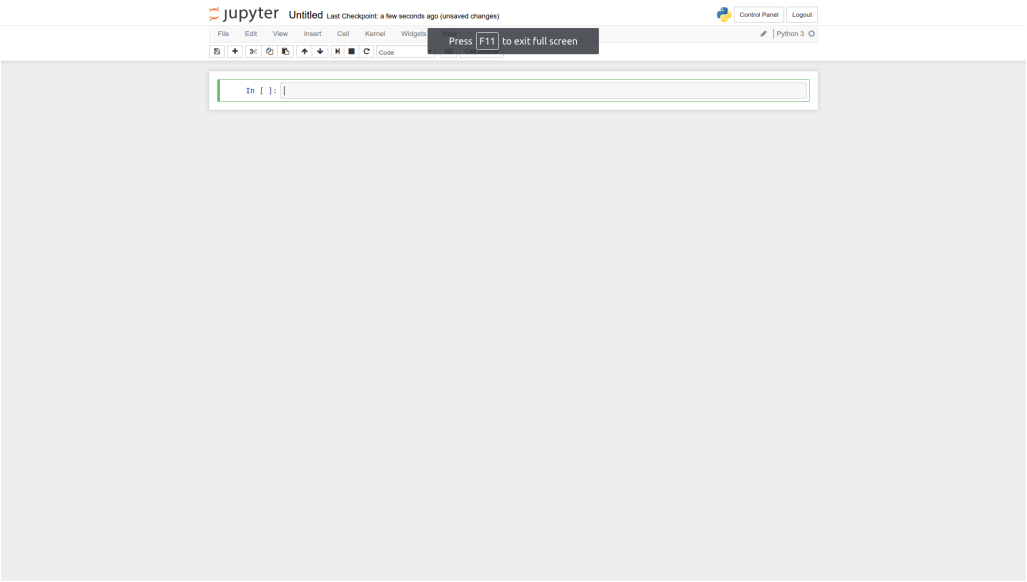

Figure 5: The new notebook.

2.4 Using the terminal

As the server is a Linux server, one can execute terminal commands. You are not a root user, so will not be able to perform certain administrator level commands. To open a terminal, click the 'New' button on the right hand side of the page. Select *Terminal* to open a new terminal.

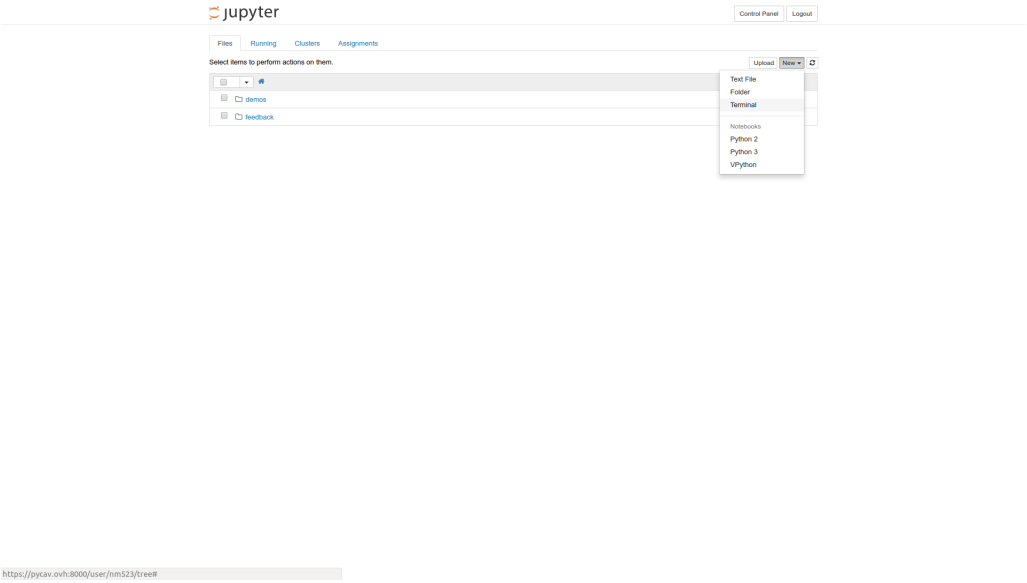

Figure 6: The terminal is useful for performing file manipulations and installing some software.

You will be redirected to a terminal instance. There are several things you can do with the terminal. If you wish, you can use *pip* to install additional python modules.

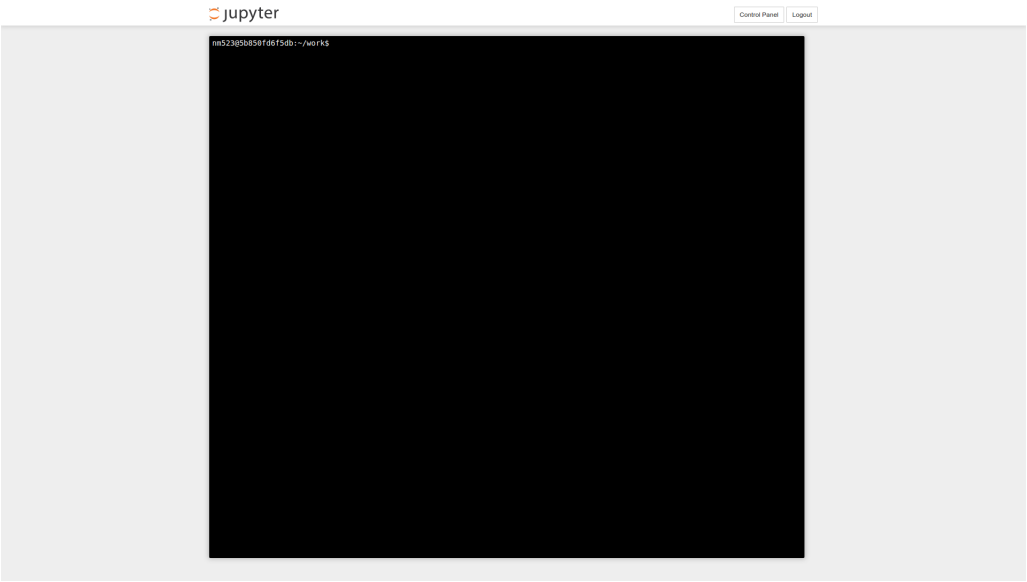

Figure 7: Root access isn't granted, so you may not be able to perform all commands that you try.

3 Assignments

3.1 Background

Some of the computational exercises within the Physics course may be assessed using these Jupyter notebooks.

The system that is being used to do this is called *nbgrader*, which serves exercises in these notebooks. It also has the facility to automatically mark some aspects of your work, and in those instances, will allow you to verify that the code works as desired before submitting it.

3.2 Downloading Assignments

Assignments can be downloaded by navigating to the 'Assignments' tab on the main Jupyter page. There may be many courses here that you can download, however, if you aren't signed up for the course your work won't be marked.

Click 'Fetch' to download a copy of the assignment.

Once you have downloaded an assignment, it will appear in your work directory. Inside the assignment folder, there will be Jupyter notebooks for you to open.

Figure 8: The assignments page, before an assignment has been fetched.

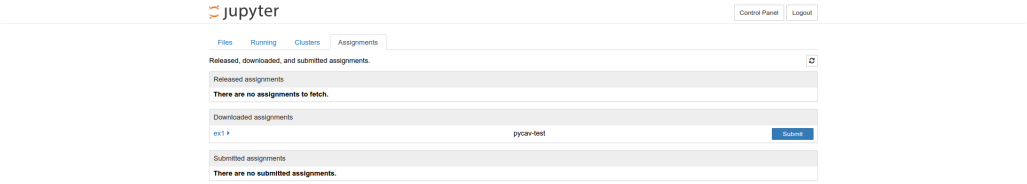

Figure 9: The assignment has successfully been fetched.

3.3 Completing Assignments

To complete an assignment, one should open the notebooks in the relevant directory. There will be instructions inside them.

Try not to modify the autograder test cells. This will return an error when the notebooks go to marking - which isn't the end of the world but it might cause delays in getting your work back to you.

On the assignments page, you can also perform what's called a validation on the notebooks. This will run

Figure 10: The work directory with the created assignment folder.

the notebook as if the assessor were using the automatic grader. It will let you know if your work fails any tests before submitting it. Note, some aspects, like graphs, are not autograded - so you still need to check your work!

3.4 Submitting Assignments

To submit an assignment after completing it, return to the assignments page. You will see a button saying 'Submit'. Click this to submit your exercise. If the submission is successful, the page will update to let you know.

You can submit multiple times! But only your most recent submission will be marked.

4 Local Installations

You can install Python locally, as well as Jupyter. This will allow you to edit notebooks offline.

If you would like a python distribution, that packages all of the relevant scientific computing modules, we recommend Anaconda[3]. This is what is installed on the Cavendish JupyterHub.

If you install anaconda before you install python it will say python[root] instead of python3.

Remember to upload your assignments to the correct folders if you download them!.

[3] `https://www.continuum.io/downloads`