Setting up FEniCS on Adroit

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Steps:

You must have an account with Adroit to perform the following steps. If you haven't registered for the account yet, you can do so by registering at `https://www.princeton.edu/researchcomputing/computational-hardware/adroit/`. We would be using miniconda for the same.

1. Log into adroit by doing ssh netid@adroit.princeton.edu.
   Once into your home directory, perform:

2. wget https://repo.continuum.io/miniconda/Miniconda2-latest-Linux-x86_64.sh

3. bash Miniconda2-latest-Linux-x86_64.sh

4. export PATH="/home/netid/miniconda2/bin:$PATH"

5. conda config –add channels conda-forge

6. conda install fenics

7. conda install -f cmake=3.6.1

This should set up fenics for your account.
We would test, as done in precept, the installation using the fenics_truss.py code from course website.
For that you would need to upload the files to cluster.
Uploading files:

1. Make a folder in your local machine, say adroit_upload

2. Transfer the python file to this folder.

3. In the terminal, perform
   rsync -rLvz ~/path_to_folder/adroit_upload/fenics_truss.py netid@adroit.princeton.edu:~/
   NOTE : This sends the file into your home directory. You can also set up a folder on cluster where you want the files to be uploaded.
   NOTE : Here we are only uploading a file. You can also upload directories.

4. You should now see a file fenics_truss.py in your home directory on cluster.

Next we test the files. Before testing we modify the code so that the plot is saved as an image which we can later download.

1. Change the line which says plt.show() to plt.savefig('Exact and FEM solution.png')

2. Add plt.close()

This would save the plot as an image which we can download and later view.

Next you can run the code as you do in your terminal by typing `python fenics_truss.py`.

This was possible to be do since the code was short and we were testing the code. In general you should submit the job to cluster by following the bash script at :
`https://www.princeton.edu/researchcomputing/education/online-tutorials/getting-started/running-serial-jobs/`.

Once you have the results you can download the files by performing:
NOTE: Assuming that you saved the files in a folder called fenics

1. rsync -rLvz netid@adroit.princeton.edu:~/fenics /path_to_folder/home_machine
   NOTE : path_to_folder/home_machine refers to the directory you want to save the files in your home machine.