Installing PYOMO and getting it to work with CPLEX

Pyomo is "a Python-based open-source software package that supports a diverse set of optimization capabilities for formulating, solving, and analyzing optimization models". There is a bunch of documentation, that in my opinion is reasonable, but certainly not outstanding.

These are some rough notes that I made for myself when installing it, as I found the process a bit tedious. If it helps anyone, then this is what I did to use pyomo with CPLEX (an optimization software package) in a jupyter notebook on linux.

Installing Pyomo

First the easy part (at least it was for me) – installing pyomo. I just opened a terminal and used the command "pip install pyomo --user". The "--user" part just directing pip to install pyomo in my home directory which does not require special user privileges.

To test that pyomo is working I just run a jupyter cell as follows and if there are no errors, assume it is all good.

```
import cplex
```

Installing CPLEX

This was a little bit more tricky. First of all you need to download CPLEX.

For this, navigate to the Google IBM academic initiative.

You have to verify, then eventually (after a couple of steps providing information and confirming your academic email) you get should get an "Add to cart" button.

If you click this you should eventually be taken (via some steps) to the download your software page

Because I prefer to use a linux server for running python in jupyter notebooks, I then installed CPLEX on the linux server. To do this, I first transferred the setup file to the linux server and put it in a directory called CPLEX, which I made using the "mkdir" command in my home directory.

To get the file to run, I had to change the permissions to get it to execute using the command "chmod -x (filename)" (replace (filename) with whatever your cplex setup file is called). I guess if your default is set up so that files you transfer will have execute permission you don't need to do this.

I then ran the setup file using the command "sudo ./(filename)" (again replace (filename) with whatever your CPLEX setup file is called).

I installed to the path /opt/ibm/ILOG/CPLEX_Studio1271

Finally, you then need to set up the python API for CPLEX. For this, I simply navigated to /opt/ibm/ILOG/CPLEX_Studio1271/cplex/python/2.7/x86-64_linux and located setup.py, and then once in the directory used the command "sudo python setup.py install"

Again, to test that cplex is working I just run a jupyter cell as follows and if there are no errors, assume it is all good.

```python
import pyomo
```

Getting pyomo and cplex working in a jupyter notebook

Now that CPLEX is installed with the python API, we just need to get it to work with pyomo in jupyter. For this, you need to specify the path using the solver factory command in pyomo. So in one cell of your jupyter notebook run something like:

```python
from pyomo.opt import SolverFactory
from pyomo.core import Var
import pyomo.environ as en
opt = SolverFactory("cplex", executable="/opt/ibm/ILOG/CPLEX_Studio1271/cplex/bin/x86-64_linux/cplex")
```

You will have to replace the executable argument with whatever your own path is.

You should now be good to start using pyomo and solving problems using