


Instruction for Installing CPLEX solver and IPOPT solver in Python

MIE1622

Jan 14, 2020

This document is prepared based on Tutorial 1 of MIE1622. For any doubts and feedback please email to yhe@mie.utoronto.ca.

Before you started, you need to install Python (<https://www.python.org>) and Anaconda (<https://anaconda.org>), version 3.7 is recommended.

It is recommended to create a separate Python environment for MIE1622 course in Anaconda. This could be done by the following commands: (For MacOS users, use terminal after you installed Anaconda to perform the commands, for Windows users, use Anaconda command prompt; This can be also done in a direct way in the Environments Tab  Environments in Anaconda-Navigator.)

```
"conda create --name your_env_name python=3.7 -y", where your_env_name  
can be something like "mie1622"
```

```
"conda activate your_env_name", now they work in separate Python environment
```

```
"conda deactivate", deactivate the environment
```

1. Installing CPLEX

Students can access ILOG CPLEX Optimization Studio academic version using IBM Academic (<http://www.ibm.com/academic>). You may need to register with your UToronto Email. After login with institutional email, find CPLEX under the DataScience/Software section and choose "Download v12.10". You may need to allow pop-up pages if you are using certain browser.

Find by part number results



Select “HTTP” as download method. (You may also use Download Director, which will require JAVA installation (www.java.com) and certain permission in your computer to allow the downloader to run in MacOS. It is recommended to use HTTP download).

Select the appropriate version based on your operating system (Windows/MacOS/Linux) and agree the terms to initiate “Download Now”.

Follow the steps in the installer. Remember the “Install Folder” you choose and you may find a reminder of Python command in “Post-Installation Steps”.



After completing installation, for MacOS users, use terminal after you installed Anaconda to perform the commands, for Windows users, use Anaconda prompt (in administrator mode with right-mouse-click on "Anaconda Prompt" -> "More" -> "Run as administrator" if CPLEX is installed in "C:\Program Files" as that directory is read-only for non-administrator users.)

```
“python /YOUR_INSTALLATION_PATH/python/setup.py install”,  
where YOUR_INSTALLATION_PATH is the path where your CPLEX is installed.  
Default installation path is /Applications/CPLEX_Studio1210.
```

This should complete your installation of CPLEX and the python API needed. To test if the installation is successful, use [cplex_example.ipynb](#) in “Lecture 1 – Introduction” in the course website to execute:

```
import cplex
```

if excuted without returning error, your installation is successful.

2. Installing CVXPY and CVXOPT

These two packages can be easily installed using **pip** in Python. (You need a “!” in Jupiter notebook to execute pip installation)

```
!pip install cvxopt  
!pip install cvxpy
```

Documentation about these two packages could be found in:

CVXOPT: <https://cvxopt.org>

CVXPY: <https://www.cvxpy.org>

One can also use **conda install** to install these two packages in terminal (MacOS) / Anaconda Prompt (Windows) by “**conda install cvxopt**” and “**conda install -c conda-forge cvxpy**”.

After successfully installation, you should be able to run the latter part of [cplex_example.ipynb](#) in “Lecture 1 – Introduction”.

3. Installing IPOPT

For MacOS users, use terminal after you installed Anaconda to perform the commands, for Windows users, use Anaconda prompt; execute:

```
"conda install -c conda-forge cyipopt" (for MacOS)
"conda install -y -c pycalphad cyipopt" (for Windows)
```

After successfully installation, you should be able to run [ipopt_example.ipynb](#) in "Lecture 1 – Introduction".