MCHE 474: Control Systems
Fall 2017 – Lab 1

Assigned: Wednesday, October 11th
Report Due: Friday, October 20th, 5:00pm

Assignment: Solve, in a Jupyter Notebook, the parts of the first Mid-Term exam identified within this document. To help, the first problem has been done for you.

Submission: The Jupyter Notebook file should be submitted via email:

- to joshua.vaughan@louisiana.edu
- with subject line `CLID-MCHE474-Lab0` where the `CLID` is your CLID.

The email should include the Jupyter Notebook file (`.ipynb` extension) with file name `CLID-MCHE474-Lab1.ipynb` where the `CLID` is your CLID.

Note: Submissions with incorrect filenames or submitted as multiple images/pdfs will be rejected.

1 Assignment Details

This Lab will use a Jupyter Notebook and the Control System Library to verify/check some of the answers from the problems on the first Mid-term. You should use the transfer functions from the solutions posted on the class website. For each problem, we'll solve the questions covering the question of steady-state error, in addition to investigating the effects of changing damping. In other words, we will be working on:

- Problem 1 e–f
- Problem 2 c–d
- Problem 3 b, f–g

A significant amount of detail on how to work these problems, including the complete solutions for the first problem are included in the Lab 1 Jupyter Notebook introduced in the next section.

1.1 Jupyter Notebook Download

The Jupyter Notebook for this assignment can be downloaded from the class GitHub Repository, from within the Jupyter Notebooks folder there. Inside that folder is a Jupyter Notebook file named `MCHE474 - Lab 1 - Mid-term 1.ipynb`. For details on how to download the file, please see the Lab 0 assignment handout. As a reminder, shift-enter will run a Jupyter Notebook cell. The text cells in the notebook explain what it is doing in each code cell.

1.2 Uniquely Identifying Your Notebook

To uniquely identify your notebook, you need to change this line of the notebook:

```
my_random_generator = np.random.RandomState(seed=1234)
```

so that the `1234` in `...(seed=1234)` matches the numerical portion of your CLID. Once you've done that, you can add cells to complete the remainder of the assignment.

2 Submission Details

Once you have done this, and have no errors in the Notebook, exit the Notebook using *File... Close and Halt*. Once you've closed the notebook, you can rename the file to `CLID-MCHE474-Lab1.ipynb` where the `CLID` is your CLID. Then, submit it via an email to `joshua.vaughan@louisiana.edu` with subject line `CLID-MCHE474-Lab1` where the `CLID` is your CLID.