ME 701 – Development of Computer Applications In Mechanical Engineering
Homework 8 – Due 11/1/2016

Last updated: October 31, 2017

Instructions: In class, we are using a pretty straightforward idea—a function evaluator—to motivate several features of GUI's and PyQt. Your job is to expand/modify the in-class exercises as specified below.

Deliverables: One TAR file `lastname_firstname.tar` that contains a Python file named `lastname_firstname.pyw` and a summary file `lastname_firstname.pdf`. All of the features request by Problems 1–3 should be implemented in `lastname_firstname.pyw`.)

Problem 1

During the first day, we developed a function/value/output GUI. Replace the function box with a drop-down box of at least three built-in functions, the first of which should be $\sin(x)$. A fourth option should be an editable option so that the user may still define a custom function.

Problem 2

The original GUI allowed for a function $f(x)$ to be evaluated at a single point x. Extend the GUI to handle array-valued inputs. Specifically, allow the users to enter `0, 1, 2, 3` or `np.linspace(0, 1, 4)` for x. Moreover, you should provide a `save as` feature that saves the x and $f(x)$ data to file.

Problem 3

During the third day, we saw how to plug into matplotlib in order to embed plots in our GUI. Your job is to create a function plotter by combining the results from the three lectures in class. You should ensure that plots can be refreshed for new f or x values. Include a screenshot of the GUI for $\sin(x)$ over $x \in [0, \pi/2]$ using 100 points in your PDF.