MATLAB and GUI (Graphical User Interface)

DSP Lab (ECE 4163 / ECE 6183)

Fall 2018

This lab assignment corresponds to the demo programs:

```
filter_cat.m
filter_gui_example_ver1.m
filter_gui_example_ver2.m
```

Exercises

1. Modify the Matlab demo program `filter_cat.m` to use different filters.

   (a) A higher-order Butterworth band-pass filter.

   (b) A Chebyshev Type II band-pass filter (use `cheby2` instead of `butter` in Matlab to design the filter coefficients).

   (c) An elliptic band-pass filter (use `ellip` in Matlab to design the filter coefficients).

   (d) A Butterworth band-stop filter (instead of a band-pass filter). SUBMIT (d)

   Produce plots showing the filters and the input and output signals, as in the demo file. Comment on your observations.

2. Matlab Graphical User Interface (GUI). Write a Matlab GUI that allows the user to control the cut-off frequency of a low-pass filter. The GUI should have a slider for the cut-off frequency. The GUI should display the SUBMIT

   - impulse response
   - frequency response (magnitude)

   These plots should update as the user adjusts the slider.