

EE 311 Matlab Homework Style Sheet

Please use the following guidelines when handing in homework that makes use of Matlab:

- variables

1. use meaningful variable names such as root1, magnitude, or phAngle instead of meaningless symbols such as x, y, and z.
2. Follow the conventions in C++ and start all variable names with a lower case letter. Use a mix of upper and lower cases for readability such as myVariable.
3. Start all user written function names with an upper case letter.

- comments

1. Add a header to *all* m-files which gives your name, the assignment number, and the date.
2. Add comments to your code where it helps to clarify what you did.
3. If your m-file requires other files such as wav files make a note of it in the header.

- plots

1. In general, do not turn in decibel plots for this class. db plots emphasize the stop band ripple and de-emphasize the pass band ripple. Turn in linear plots unless specifically told to do otherwise. Note that using the freqz function without setting it equal to something on the left side automatically produces a db plot. Here is an example of how to get a linear plot:

```
fs = 11025;
Rs = .005;RsDB = -20*log10(Rs);
Rp = .01;RpDB = -20*log10(1-Rp);
fps = 480;fst = 900;
[N Wn] = cheblord(fps/(fs/2), fst/(fs/2), RpDB, RsDB);
[num den] = cheby1(N, RpDB, Wn);
[H f] = freqz(num, den, 1024, fs);
plot(f, abs(H));
```

2. For all digital plots put the frequency variable in Hertz. For all analog plots put the frequency variable in radians/second.
3. Printing plots directly from Matlab gives you little control over the size of the plot. After making a plot use the edit menu to copy the plot to the clip board. Open a blank document in Word and paste your plot into a Word document. From Word you can then resize the image and add a figure number or comments.
4. For assignments which ask that you show that a filter you have designed meets specifications you should use blow ups of your plots. You can use the axis command in Matlab to blow up any portion of a plot. The general form of the axis command is

```
axis([xmin, xmax, ymin, ymax]);
```

5. Use the label commands in Matlab to label all axis. Use the title command to add a title to your plots. Here is an example that labels the x and y axis and adds a title. You can also add titles and labels directly from the plot. On the Matlab plot click on the insert menu.

```
%BPEllip.m
%This program creates an elliptic band pass filter
fs = 22050;
Rp = .005; RpDB = -20*log10(1-Rp);
Rs = .005; RsDB = -20*log10(Rs);
flp = 4000;fls = 4500;fus = 5500;fup = 6000;
Wp = [flp fup]/(fs/2);Ws = [fls fus]/(fs/2);
[N Wc] = ellipord(Wp, Ws, RpDB, RsDB);
[num den] = ellip(N,RpDB, RsDB,Wc);
[H f] = freqz(num, den, 512, fs);
figure(1);clf;
plot(f, abs(H));
title('band pass elliptic filter');
xlabel('frequency in Hertz');
ylabel('Magnitude');
```