Lab 2 for Math 398 Section 952: Graphics in Matlab

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Fall 2002

This document constitutes your second lab assignment, which will be largely worked in the lab session. It will draw on material from Lecture 3, so it would be a good idea to go to my Home Page (http://www.math.unl.edu/~tshores/) and thence to my Teaching Page, thence to the Math398 Section 952 Home Page. Really, it would be a good idea to bookmark the class home page.

Reminder: Here is how to do these lab assignments. You will need to open a Matlab session and have this pdf file open for reading as well. To keep a recording of your work, you issue the following command to Matlab

```
> diary 'myfile'
```

Matlab will then send a copy of all your typed input and the output to a file called 'myfile.' For clarity, use descriptive names for your files, such as 'jsmithasgn1' so that when I save the files that you will email me, I can tell what it's about by the title. If at any point you want to stop the diary feature, issue the command

```
> diary off
```

To resume the diary feature, simply type

```
> diary on
```

This will cause input to be appended to myfile. You can make comments in your homework file by typing % at the command line and this too will be recorded. For example

```
> % This is a comment.
```

Be sure to start your file with the comments

```
> % Name:  yourname
> % Email:  your email addresss
```

When you end your session, the file will be closed and you can view it and even edit it with a text editor. As a matter of fact, you can even edit and view it with the Matlab Editor. Just type

```
> edit myfile
```

When you have finished the assignment, email the file to me as an attachment. My email address is `tshores@math.unl.edu`. Here is the assignment. As usual, turn the diary command on to record your session. Unless otherwise indicated, it is not necessary to save the graphics you create for the assignment. Here is the assignment.

Problems

1. Finish carrying out the commands in Matlab Lecture 3, from the Handle Graphics section to (but not including) the Animation section. When you have finished, enter this command at the command prompt: "`set(fig1)`"

2. Clear all variables, close all figures and create a single figure with two subplots in one column. In the first subplot, do a rectangular plot of $y = \sin(t)$, $0 \leq t \leq 2\pi$ in color red. Label the axes and give the plot a title. In the second, do a polar plot of $r = \cos(t)$, $0 \leq t \leq 2\pi$. Use only 17 equally spaced distinct points for t and plot in green, with a circle marker at each node, connected by dotted lines. Give the plot a title.

3. Clear all variables, close all figures and create a single figure with four subplots displayed in rectangular form. Get help on the "ezsurf" command and use it to create in the top left subplot a plot of $xy\cos(x^2 + y^2)/(1 + x^2 + y^2)$, $-2 \leq x \leq 2$, $-2 \leq y \leq 2$. In the lower left subplot create a contour plot for the same function over the same domain. Right after this, issue a "view(3)" command. What is the effect? In the remaining subplots, duplicate the surface plot on the left by using the "mesh" command and the contour plot on the left by using the "contour" command.

4. Close all open figure windows. Create a vector x whose entries go from 0 to 2π in steps of 0.1. Now use a for loop to create a vector of frames for the plot of $\sin(x - \pi t)$ against x as t goes from $1/40$ to 1 in steps of $1/40$. Play the movie. Does it play in it's own figure window? If not, open a new figure and play it there.