Math 343H Lab 1: Matlab Introduction

Objective

This lab is a limited introduction to Matlab. Topics include: The command line, scripts, and functions. Programing logic, such as loops and conditional statements, and both the `plot` and `help` functions will also be explored.

Using the command line

Create a matrix by typing:

```
>> A = [1 2 3;4 5 6;7 8 9]
```

Create another matrix by typing:

```
>> B = [-4 3 2;5 3 -1; -2 1 1]
```

Now add the two by typing:

```
>> A + B
```

Multiply the two by typing:

```
>> A * B
```

Component-wise multiplication is performed via:

```
>> A .* B
```

Writing a script

Type the following into a file called myscript.m. Be sure the path is set to the correct directory:

```
A = [1 2 3;4 5 6;7 8 9]
B = [-4 3 2;5 3 -1; -2 1 1]
A + B
A * B
A .* B
```

Now execute the script by typing `myscript` at the command line. What happens when you put semi-colons at the end of commands?

Writing a function

Type the following into a file called sassy.m. Be sure the path is set to the correct directory:

```
function out=sassy(n)
%
% This is how comments are placed in functions and scripts
%
out = 0;
for k=1:n
     out = out + k^2;
end
```

Now execute the function by typing `sassy(5)` at the command line.

The plot function

From the command line, type the following:

```
>> x = linspace(0,10,100)

>> y = sin(x)

>> plot(x,y,'.-b')
```

by typing `help plot` figure out how to change the command to be red with asterisks as the point values.

Assignment

Problem 1. *Write a script that will add up all of the odd numbers from 5 to 99. What is the sum? Hint: Type* `help if` *to learn how to do if/then statements. There are other ways of doing this, however.*

Problem 2. *Print out a plot of the function* $f(x) = x^2 - 7x + 10$ *from* $x = 0$ *to* $x = 10$.

Problem 3. *Create a random* 5×6 *matrix. Use the command* `rref` *to row reduce it. Hand in the matrix and it's reduced row-echelon form. Hint: Type* `help rand` *or* `help randn` *to learn how to produce random numbers.*