Homework 3 Solutions

1. (Exercise 2, p. 11 of Matlab handout) Write a Matlab script file to plot three functions on one graph. Plot $y = \sin(x)$ in red, $y = sin(2x)$ in black, and $y = sin(3x)$ in green, with x ranging from -4 to 8.

   What should you turn in? Write your answer as a short script file. In the editor, under `File`, you will find the option to publish your script file. Select that option, then print the result and turn it in.

   SOLUTION: Something like:

```
x=linspace(-4,8);
y1=sin(x); y2=sin(2*x); y3=sin(3*x);
plot(x,y1,'r',x,y2,'k',x,y3,'g');
```

2. What does the following Matlab code do?

```
x=[1,-1,2,-2,3,-3,4,-4];  %Could be a randomly chosen vector
n=length(x);                  %Finds the length of vector x (8 in this one)
m=randperm(n);           %Randomly permutes the integers from 1 to n (1 to 8)
x=x(m);                        %x is now a randomly permuted version of itself.
```

3. Write a Matlab function that will take in two matrices, A, B and will output a matrix of the same size where

$$C(i,j) = \max\{A(i,j), B(i,j)\}$$

   Use the built-in `max` function- See Matlab's help file by typing (in the command window) `doc max`

   Note: Don't use a loop- Your answer should be a one-line function

   What should you turn in? First, write your function and save it as `mymax1.m`. Next, write a short script file that creates two matrices that are 4×10, and whose entries are (uniformly) random numbers between 1 and 6. Call your function and have the result printed to the screen. You can then publish the script file, print it and turn it in.

   SOLUTION:

```
function C=mymax1(A,B)
C=max(A,B);

%Script file:
A=ceil(6*rand(4,10)); B=ceil(6*rand(4,10));
C=mymax1(A,B);
```

4. Modify `banditScript.m` to run three times, where `E=0.0, E=0.01, E=0.1` and, where you save R_{avg} as y_1, then y_2, then y_3. Plot the result to see if you get Figure 1, p. 7.

   What should you turn in? After writing your script (you may call it `banditScript2.m`, publish it, print the output and attach.

   SOLUTION: Figure

5. Example we'll do together (Nothing to turn in).