W1005 - Fall 2014
Homework 1

- Due by Friday 4pm (Sept. 19th).
- See instructions on course website.
- Always include your name and UNI at the top of your submitted files.

1. Open a blank file and call it "hw1.m". You will use this script throughout the assignment. Each problem solution consists of one or several MATLAB statements. You should add these statements to your script. Each problem should start with a comment indicating the problem number.

2.
   a) Create a row vector in variable x:
      0.5 2.03 70
      Do not suppress the output.

   b) Next create a column vector in variable y:
      142
      -150
      167
      Again, do not suppress the output.

   c) Set another variable z equal to x times y (matrix multiplication, not elemental multiplication). This time suppress the output.
   d) Finally display the value of z using the disp function (For more information on the disp function type help disp).

3.
   a) Create a random, uniformly distributed 5x6 matrix called A.
   b) Find the maximum element of A. Return its value only in the variable 'm1'.
   c) Initialize a variable 'B' to the empty matrix.
   d) Set B to be equal to the sub-matrix of A which consists of the 2nd and 4th columns only.

4.

a) Create a row vector ‘v1’ of size 1x200 where each element is equal to 15 (suppress output).
b) Create a new row vector ‘v2’ of size 1x100 where the value at each index is the index times 3, that is, v2(k) = k*3 for each k in the appropriate range (1…100).
c) Create a new vector b, that contains only the odd indexed (1,3,…,99) elements of v2.
d) Create a new vector c, which is the horizontal concatenation of two vectors: b and v2.

5.

a) Explicitly create a matrix A:
   55 77 99
   11 33 55
   88 66 44
b) Sort A along columns (show output)
c) Add 5 to each element of A (hint: there are multiple ways of doing this, some more efficient than others).
d) Replace each element in the 2nd row of A with the value 1.5 (same hint applies).

6.

a) Type ‘help magic’ in the command line and read the documentation. Why is it called a magic square? (answer using block comments)
b) Create a magic square of size 6, and compute the sum of the first row minus the first element. Show output.

7.

a) Create a random, uniformly distributed 4x4 matrix called A, and a 4x4 identity matrix D.
b) Multiply A by D (matrix multiplication) and display the result
c) Set C to be the transpose of A, suppress output.