COMS 3101 - Fall 2013
Homework 1

- Due by start of class (Monday 4pm).
- See submission instructions.

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.

2.
   a) Create a row vector in variable x:
      10 20 30
      Do not suppress the output.

   b) Next create a column vector in variable y:
      14
      15
      16
      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 3x3 matrix called A.
   b) Find the maximum element of A. Return its value only in the variable 'e1'.
   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 1st and 3rd columns only.

4.
   a) Create a row vector 'v1' of size 1x100 where each element is equal to 5 (suppress output).

b) Create a new row vector ‘v2’ of size 1x100 where the value at each index is the index times 2, that is, v2(k) = k*2 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:
   5 7 9
   1 3 5
   8 6 4
b) Sort A along columns (show output)
c) Add 2 to each element of A (hint: there are multiple ways of doing this, some more efficient than others).
d) Replace each element in the first row of A with the value 1 (same hint applies).

6.

a) In order to use comments in a script, we need to precede the line with a particular symbol. Use MATLAB documentation (help) or any other source to find the symbol and add a one-line comment to your script.
b) Type ‘help magic’ in the command line and read the documentation. Why is it called a magic square?
c) Create a magic square of size 5, and compute the sum of the first row minus the first element. Show output.