COMS 3101 - Fall 2013
Homework 1 (Extra)

- This part is optional.
- Due by start of class (Monday 4pm).
- See submission instructions.

1. A MATLAB guru challenges you for the following game: you start by choosing any positive integer (1,2,….), call it X.
   If X is an even integer you divide X by 2.
   If X is an odd integer you multiply X by 3 and add 1.
   You continue this procedure until at some point you get 1 as your next integer. At that point you stop.

   For example: suppose you choose 5 as your integer. Then you will generate the following sequence: 5, 16, 8, 4, 2, 1.

   The guru claims that this is true for ANY integer you choose. That is, you will always end up with 1 at some point.

   a) Guess whether the claim is correct or not, and give a brief justification (NOTE: the question is ONLY asking for a guess, not a proof).

   b) Open a blank script and call it "ehw1b.m".
      Write a script that solves the problem above.
      - Assume that the value of X is hardcoded as the first line of your script.
      - Hint: you should use loops.
      - Store the sequence you generate in the variable S (a column vector). Display S and its length.

   c) Open a blank file and call it "ehw1c.m"
      Write a function that solves the problem above.
      - Type 'help function' in the command line to learn how functions can be defined.
      - Your function should take one input argument (the integer X)
      - Your function should have one output argument (the vector S)