HW 2 Solutions
Math 472, Spring 2011

The homework was to work out exercises 1-5 in the second handout. This included more on Matlab, but was essentially a handout on the Case Study: Reinforcement Learning (available on the class website).

1. What is the Matlab command to create the array x which holds the integers: $2, 5, 8, \cdots 89$?

   ```
   x=2:3:89;
   ```

2. What is the Matlab command to zero out the even numbered indices?

   SOLUTION: There are various ways of doing this. For example:

   ```
   x(2:2:88)=zeros(1,44);
   ```

3. (This was actually exercise 8 from the handout by Sauer) Will $1 + x > 1$?

   (a) If $x = 2^{-53}$, then the normalized floating point form (before rounding) for $1 + x$ is:
   $$1.000 \cdots 000 \ 1000 \cdots \times 2^0$$
   This is the exceptional case- To make bit 52 zero, simply truncate. Therefore, in this case, "$1 + x = 1$" (in floating point form).

   (b) If we add 2^{-60}, we note that the only change is in the rounding rule. We are not in the exceptional case anymore, so round up to get:
   $$fl(1 + x) = 1.000 \cdots 001 \times 2^0$$
   And now "$1 + x > 1$".

   (c) Given a matrix A, the line: `R=sqrt(sum(A.*A))` produces a row of numbers, where each value is the norm of the corresponding column of A.

   (d) The first part of this is the activity. For the second part, in Matlab you should get:

   ```
   >> help banditE
    FUNCTION [As,Q,R]=banditE(N,Aq,E)
      Performs the N-armed bandit example using epsilon-greedy
        strategy.
      Inputs:
            N=number of trials total
    etc
   ```

   These are the comments we typed into the function file.