SYS 411 - Machine Learning
Genetic Algorithm Mini-Project

Problem Statement

You are to write a genetic algorithm solution to find the maximum of the function f(x,y) = x - y where x and y are 16 bit unsigned integers. **The purpose of this problem is NOT to exercise your ability to encode a clever representation of the problem, nor to select a correct fitness function for this trivial problem, but to translate your general knowledge of GA's into actual working code.** For that reason, the focus here is on writing and testing your GA code, and generalizing the solution as much as possible. You may wish to "hard-code" your first pass program and then generalize your code, or design it to be a general solution in the first pass.

You should build a "standard" GA including the following features:

1) User specified population size with random initialization of all individuals
2) User specified mutation rate and crossover rates to be applied to each new generation
3) User specified one-point or two-point crossover of two chromosomes
4) Binary tournament selection of the mating pool (pull two, put the most fit in the new generation, repeating until a full new gen is created. Binary tournament is a specific version of n-ary tournament which you will want in your final solution)
5) Full replacement of each generation (it is possible to create a new generation while still retaining some individuals from the old)