# CSCI 4560/6560 Evolutionary Computation

## Assignment Number 1: Due 9/6/2007 **(in class)**

1. [**10 points**] Solve Problem 1 Page 35 of the text book.
2. [**10 points**] Solve Problem 3 Page 35 of the text book.
3. [**10 points**] Solve Problem 4 Page 35 of the text book.
4. [**20 points**] The $subset_{21}$ problem is stated as follows. Given a set of N positive integers $X = \{x_1, x_2, \ldots, x_n\}$. Find a subset $P$ of the set $X$ such that the sum of the elements of $P$ is equal to 21. For example, if N=5 and the set $X = \{12, 17, 3, 24, 6\}$, the set $P = \{12, 3, 6\}$ is a valid solution for the $subset_{21}$ problem in this example.

   Formulate the $subset_{21}$ problem as a Genetic Algorithm optimization. You may use binary representation, OR any representation that you think is more appropriate. you should specify:

   - A fitness function. Give 3 examples of individuals and their fitness values if you are solving the above example (i.e. $X = \{12, 17, 3, 24, 6\}$).
   - A set of mutation and/or crossover and/or repair operators. Intelligent operators that are suitable for this particular domain will earn more credit.
   - A termination criterion for the Genetic Algorithm optimization which insures that you terminate with a valid solution for the $subset_{21}$ problem if a solution exists.