1. **[10 Points]**

   The *Partition* problem is stated as follows. Given a set of N positive integers $X = \{x_1, x_2, \ldots, x_n\}$ separate them into two subsets P_1 and P_2 such that the difference between the sum of the elements in P_1 and the sum of the elements in P_2 is minimized. For example, if N=5 and the set $X = \{12, 17, 3, 24, 16\}$, the sets $P_1 = \{12, 24\}$ and $P_2 = \{17, 3, 16\}$ constitute an optimal solution for the *Partition* problem in this example as they have equal sums.

   Formulate the *Partition* problem as a Genetic or Evolutionary Algorithm optimization. you should specify:

   - A representation.
   - A fitness function. Give 3 examples of individuals and their fitness values if you are solving the above example (i.e. $X = \{12, 17, 3, 24, 16\}$).
   - A set of mutation and/or crossover and/or repair operators. Intelligent operators that are suitable for this particular problem domain will earn more credit.
   - A termination criterion for the evolutionary optimization.