CSE 2320-003 Lab Assignment 3

Due April 6

Goals:

1. Understanding of dynamic programming.

2. Understanding of subset sums.

Requirements:

1. Design, code, and test a C program that uses ***dynamic programming*** to determine ***two*** separate subsequences of the input such that the first subsequence sums to the first target value and the second subsequence sums to the second target value.

   The input should be read from standard input (which will be one of 1. keyboard typing, 2. a shell redirect (<) from a file, or 3. cut-and-paste. Do NOT prompt for a file name!). The first line of the input will give *n*, the length of the sequence, along with the two target values. Each of the remaining input lines will include one sequence value. All values will be positive integers.

   Your program should echo the target values and the input sequence. If a problem instance has a solution, each of the two subsequences should be output and clearly labeled. A message should be provided for instances without a solution.

2. Submit your program on Canvas by 12:45 pm on April 6. One of the comment lines should indicate the compilation command used on OMEGA.

Getting Started:

1. Unlike the *one-dimensional* situation for ordinary subset sums (Notes 07.F), this problem is *two-dimensional*. The same concept of the cost function value being an index to the input *S* values is to be used. Similarly, as the backtrace moves through the cost matrix, the indices to *S* will be in strictly descending order.

2. Dynamic programming is the only acceptable method for doing this lab. Do not use a greedy approach!