COSC201: Tutorial Week 10
Greedy Algorithms

1. Huffman coding is an example of a greedy algorithm for computing prefix codes that can be used to do lossless compression. It works in a bottom-up greedy fashion. Assume we have the following letter frequencies:

	a	b	c	d	e	f
frequency	45	13	12	16	9	5

   (a) Show the Huffman code tree with individual letters in the leaves of the tree, frequencies in the nodes, and 0 or 1 on the branches.

   (b) Encode the following string "abdacadabda".

   (c) How many bits would be used if we used the same code length for each character?

2. Consider the following set of values and weights:

$$W = [20, 30, 10, 5, 15, 25, 3, 17, 22, 31]$$
$$V = [100, 120, 60, 40, 20, 45, 23, 72, 102, 31]$$
$$W_{\max} = 50.$$

   In the lecture, we had a look at filling the knapsack for the 0-1 knapsack problem. Try this problem for the fractional knapsack problem.