Lab 8 (21 Oct 2020)

Problem 1 : Suitably modify the dynamic programming algorithm for computing the longest increasing subsequence from last week to print all the longest increasing subsequences if there are more than one of them.

Problem 2 : Write a program to print all possible valid ways to break a sentence without spaces into a sequence of valid words. Use a dictionary to store the set of valid words. For e.g. if the dictionary is {a, an, at, the, are, man, hunt, go, ant, he, mango}

Sample Run:

Enter the sentence without spaces: anthehuntmango
The possible sequences of words are:
ant he hunt mango
an the hunt mango
ant he hunt man go
an the hunt man go

Problem 3: Given an unlimited supply of coins of denominations $x_1, x_2, \ldots, x_n$, we wish to make change for a value v; that is, we wish to find a set of coins whose total value is v. This might not be possible: for instance, if the denominations are 5 and 10 then we can make change for 15 but not for 12. Give an O(nv) dynamic-programming algorithm for the following problem.

Input: $x_1, x_2, \ldots, x_n$; v
Output: YES, if it is possible to make change for v using coins of denominations $x_1, x_2, \ldots, x_n$,
NO otherwise

A sample input/output corresponding to the above example is as follows:

Input:
Enter the denominations of the coins: 5 10 12 18
Enter the values v to make change for: 8 15 22 23 26 30

Output:
NO YES YES YES NO YES