CSE 204: Data Structures and Algorithms I Sessional

Online: Dynamic Programming (B2)

Coin Changing Problem

Suppose, we have a currency system with n types of notes. The values of the notes are $v_1,...,v_n$. Now, we want to pay an amount V (exactly) with as few notes as possible (you can use each note as many times as you wish). Implement a dynamic programming algorithm for this problem. You can assume that in that currency system making all amounts is possible.

Input format:

The first line will contain an integer n denoting the number of notes. The next n lines will contain their values. Finally, the last line will contain the amount V.

Input will be given in a file named **input.txt** .

Example: input.txt

```
10
1
2
4
5
10
20
40
50
100
83
```

Output format:

The total number of notes needed.

Example: output.txt

```
4
```

In this case, 83=40*2+2*1+1*1.