# Currency Denomination

| Problem Code | hw04c_currency |
|---|---|
| Running Time Limit | 1 sec |
| Memory Limit | 16 mb |

## Objective

- Be able to solve a problem using dynamic programming approach or better

## Introduction

Baht currency is denominated into 1000, 500, 100, 50, 20 bank notes and into 10, 5, 2, 1 coins. In this denomination, we can easily represent any amount of money by trying to use the largest denomination first and then proceed to the smaller one.  For the current denomination, this approach yields minimal number of notes and coins. However, if the currency is denominated differently, this approach might not yield minimal number of notes and coins. For example, if we have 5, 4, 1 baht coins and wish to represent the value of 8. The largest first approach would yield one of 5 baht coin and 3 of 1 baht coin. However, the optimal representation would be two of 4 coins.

In this problem, denominations are given and we wish to compute the representation of money that uses the smallest number of notes and coins.

## Task

You task is to calculate a representation of a specific value of money from given denomination.

## Input

The first line contains two integers $N$, the number of denomination, and $M$, the value of money to be represented.  It is guaranteed that $1 \le N \le 30$ and $1 \le M \le 100,000$. This is followed by another line containing $N$ integers that describe the denominations in decreasing order. It is also guaranteed that the last denomination is always 1.

## Output

The output contains a single integer representing the smallest number of all denomination that can represent the value $M$.

## Example

### Ex1

| Input | Output |
|---|---|
| 4  28<br>10 5 2 1 | 5 |

To represent the value of 28, we use 2 of 10 baht coins, 1 of 5 baht coins, 1 of 2 baht coins and 1 of 1 baht coins. This sums into 5 coins.

## Ex2

| Input | Output |
|---|---|
| 3 13<br>5 4 1 | 3 |

To represent the value of 13, we use 2 of 4 baht coins and 1 of 5 baht coins. This sums into 3 coins.

## Ex2

| Input | Output |
|---|---|
| 3 13<br>5 4 1 | 3 |

To represent the value of 13, we use 2 of 4 baht coins and 1 of 5 baht coins. This sums into 3 coins.