Training 7 - Greedy - 20192

A. CHANGE

1 second❓, 256 megabytes

Minh go shopping at the SS shop. The shop has currency denominations: 1$, 5$, 10$, 50$, 100$, 500$. Minh takes some items at the shop and pay an amount of 1000$. Your task to devise a method to pay back amount to customer using fewest number of money notes.

Input

The input consists of only one single integer N ($1 \le N \le 999$) denoting the total value of the taken items.

Output

The output consists of only one single integer denoting the number of money notes.

input
1
output
15

input
3
output
13

B. Planting Trees

1 second❓, 256 megabytes

Farmer Jon has recently bought n tree seedlings that he wants to plant in his yard. It takes 1 day for Jon to plant a seedling: {Jon isn't particularly hardworking.}, and for each tree Jon knows exactly in how many days after planting it grows to full maturity. Jon would also like to throw a party for his farmer friends, but in order to impress them he would like to organize the party only after all the trees have grown. More precisely, the party can be organized at earliest on the next day after the last tree has grown up.

Help Jon to find out when is the earliest day when the party can take place. Jon can choose the order of planting the trees as he likes, so he wants to plant the trees in such a way that the party will be as soon as possible.

Input

The input consists of two lines. The first line contains a single integer N ($1 \le N \le 100\,000$) denoting the number of seedlings. Then a line with N integers t_i follows ($1 \le t_i \le 1\,000\,000$), where t_i denotes the number of days it takes for the ith tree to grow.

Output

You program should output exactly one line containing one integer, denoting the earliest day when the party can be organized. The days are numbered $1, 2, 3, \ldots$ beginning from the current moment.

input
1
1
output
3

C. ATM

1 second❓, 256 megabytes

Vinh works for an ATM machine manufacturing company. The basic functionality of an ATM machine is cash withdrawal. When a user requests a cash withdrawal of W VND (Vietnamese Dong), the ATM has to dispense N money notes such that they sum up to W. For the next generation of ATM machines, Vinh is working on an algorithm to minimize the number of N of money notes for each cash withdrawal transaction.

Your task is to help Vinh to do his job given that the money notes come in the values of

$$1000, 2000, 3000, 5000, 1000 \cdot 10^1, 2000 \cdot 10^1, 3000 \cdot 10^1, 5000 \cdot 10^1$$

where c is a positive integer and Vinh has unlimited supply of money notes for each value.

Input

The input file consists of several datasets. The first line of the input file contains the number of datasets which is a positive integer and is not greater than 1000. The following lines describe the datasets.

The first line consists of one positive integer W ($W \le 10^{18}$);

The second line consists of one positive integer c ($c \le 15$).

Output

For each dataset, write in one line two space-separated integers N and S where S is the number of ways to dispense the fewest number N of money notes. In case there is no way to serve the cash withdrawal request, write out 0 in one line instead.

input
2
1000
1
7000
1
output
1 1
2 1