



Section No.	01	Section Name	Coding for Product Development Companies
Q Paper No.	03	Topic Name	Arrays
Total Marks	30	Time Limit	90 minutes

Q.1) Eat Less

Marc loves cupcakes, but he also likes to stay fit.

He eats n cupcakes in one sitting, and each cupcake i has a calorie count $c[i]$.

After eating a cupcake with c calories, he must walk at least $2^j * c$ (where j is the number cupcakes he has already eaten) miles to maintain his weight.

Given the individual calorie counts for each of the cupcakes, find and print a long integer denoting the minimum number of miles Marc must walk to maintain his weight. Note that he can eat the cupcakes in any order.

Input Format

The first line contains an integer, N , denoting the number of cupcakes.

The second line contains N space-separated integers describing the respective calorie counts of each cupcake, $c[1] \dots c[n]$.

Constraints

$1 \leq n \leq 40$

$1 \leq c_i \leq 1000$

Output Format

Print a long integer denoting the minimum number of miles Marc must walk to maintain his weight.

#Notes:

Has to be done greedily so that you can burn as many calories as possible

Sample Input

```
20
353 726 36 574 234 746 507 244 382 349 107
279 608 87 459 793 710 73 758 945
```

Sample Output

```
73444139
```



Q.2) The Big Game

Aditya was bored because of LCS class. So he bunked his class and went to lab. When he reached the lab he saw his friends playing NFS the Run (they too bunked). He asked his friends Kasur and Kaushal to play a new game created by him.

The game is as follows.

Given N integers. The player can make several steps. In a single step he/she can choose an element of the sequence (let's denote it a_i) and delete it, after that all elements equal to a_i+1 and a_i-1 also must be deleted from the sequence. That step brings a_i points to the player. Since Kasur and Kaushal are perfectionists, they needed to get as many points as possible. Help them.

Input Format

First line contains N , the number of elements in Aditya's sequence.

Next line contains N integers a_i

Constraints

$$1 \leq N \leq 105$$

$$1 \leq a_i \leq 105$$

Output Format

Print a single integer, the maximum point they can get

Sample Input

```
9
1 2 1 3 2 2 2 2 3
```

Sample output

```
10
```

Explanation:

At first step we need to choose any element equal to 2. After that step our sequence looks like this $[2, 2, 2, 2]$. Then we do 4 steps, on each step we choose any element equals to 2. In total we earn 10 points.



Q.3) Sum of the Diagonals

Find the sum of the diagonals of a $N \times N$ square matrix

Input Format

First line contains N , the size of the grid

Then N^2 numbers giving the value of the row and column

Output Format

Print the sum

Sample Input

3

1 2 3

4 5 6

7 8 9

Sample output

25