

Problem 1 – Triathlon

There is triathlon in the country of tutoria. There are 3 contests – Programming, Pole Vault, Doughnut Eating. These 3 have to be done in order by every citizen. However there is only 1 computer in the kingdom and hence only 1 person can do Programming at a time. The other tasks can be done simultaneously by as many people as possible. The King knows how long each person takes to complete each task. We have to design a program that calculates the earliest time at which the contest is over.

eg.

Person	Programming	Pole Vault	Doughnut Eating
1	18	7	9
2	23	19	13
3	20	13	15

If the order is 1,2,3 then time taken by 1 is $18+7+9 = 34$

Time taken by 2 is $18+23+19+13 = 55$

Time Taken by 3 is $18+23+20+13+15 = 89$

Therefore time to complete event is $\text{Max}(34, 55, 89) = 89$.

If order followed is 2, 3, 1 then Answer is $\text{Max}(55, 71, 77) = 77$. This is the best answer

Input

```
3
18 7 9
23 19 13
20 13 15
```

Output

```
77
```

Problem 2 – Table Sum

A table is one with 2 rows. The first row is fixed.

eg. $\begin{matrix} 7 & 1 & 6 & 2 \\ 1 & 2 & 3 & 4 \end{matrix}$

Its sum is the maximum of sum of number in row 1 and row 2. For this table it is – $\text{Max}(7+1, 1+2, 6+3, 2+4) = 9$

The 2nd row can be shifted to the left as follows

$\begin{matrix} 7 & 1 & 6 & 2 & \text{sum} = 10 \\ 2 & 3 & 4 & 1 \end{matrix}$

also

$\begin{matrix} 7 & 1 & 6 & 2 & \text{sum} = 10 \\ 3 & 4 & 1 & 2 \end{matrix}$

also

$\begin{matrix} 7 & 1 & 6 & 2 & \text{sum} = 11 \\ 4 & 1 & 2 & 3 \end{matrix}$

These are the only 4 possible ways.

Given the first row, print the sum of all possible tables.

Eg.

Input

4
7 1 6 2

Output

9 10 10 11