E - Most Valuable Parentheses

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 450 points

Problem Statement

You are given a sequence of non-negative integers $A = (A_1, \ldots, A_{2N})$ of length $2N$.

Define the score of a parenthesis sequence s of length $2N$ as follows:

- For every position i where the i-th character of s is), set A_i to 0, then take the sum of all elements of A.

Find the maximum possible score of a correct parenthesis sequence of length $2N$.

You are given T test cases; solve each.

▶ What is a correct parenthesis sequence?

Constraints

- $1 \leq T \leq 500$
- $1 \leq N \leq 2 \times 10^5$
- For each input file, the sum of N over all test cases is at most 2×10^5.
- $0 \leq A_i \leq 10^9 \, (1 \leq i \leq 2N)$
- All input values are integers.

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Input

The input is given from Standard Input in the following format:

$$T$$
$$\text{case}_1$$
$$\text{case}_2$$
$$\vdots$$
$$\text{case}_T$$

case_i represents the i-th test case. Each test case is given in the following format:

$$N$$
$$A_1$$
$$A_2$$
$$\vdots$$
$$A_{2N}$$

Output

Output T lines. The i-th line ($1 \le i \le T$) should contain the answer for the i-th test case.

Sample Input 1   Copy

```
2
3
400
500
200
100
300
600
6
1000000000
1000000000
1000000000
1000000000
1000000000
1000000000
1000000000
1000000000
1000000000
1000000000
1000000000
1000000000
```

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Sample Output 1

```
1200
6000000000
```

In the first test case, choosing the correct parenthesis string `(())()` gives a score of $400 + 500 + 0 + 0 + 300 + 0 = 1200$.

No correct parenthesis string yields a higher score, so the answer is 1200.

Note that, as in the second test case of this sample, the answer may exceed the 32-bit integer range.

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