C. Remove the Ends
Zadanie z Codeforces / Div. 2 / C

Zadanie pochodzi z platformy Codeforces:
https://codeforces.com/contest/2064/problem/C

C. Remove the Ends

time limit per test: 3 seconds
memory limit per test: 256 megabytes

You have an array a of length n consisting of **non-zero** integers. Initially, you have 0 coins, and you will do the following until a is empty:

- Let m be the current size of a. Select an integer i where $1 \le i \le m$, gain $|a_i|$* coins, and then:
  - if $a_i < 0$, then replace a with $[a_1, a_2, \ldots, a_{i-1}]$ (that is, delete the suffix beginning with a_i);
  - otherwise, replace a with $[a_{i+1}, a_{i+2}, \ldots, a_m]$ (that is, delete the prefix ending with a_i).

Find the maximum number of coins you can have at the end of the process.

*Here $|a_i|$ represents the absolute value of a_i: it equals a_i when $a_i > 0$ and $-a_i$ when $a_i < 0$.

Input

The first line contains an integer t ($1 \le t \le 10^4$) — the number of testcases.

The first line of each testcase contains an integer n ($1 \le n \le 2 \cdot 10^5$) — the length of a.

The second line of each testcase contains n integers $a_1, a_2, \ldots, a_n$ ($-10^9 \le a_i \le 10^9$, $a_i \neq 0$).

The sum of n across all testcases does not exceed $2 \cdot 10^5$.

Output

For each test case, output the maximum number of coins you can have at the end of the process.

Example

Input

3
6
3 1 4 -1 -5 -9
6
-10 -3 -17 1 19 20
1
1

Output

23
40
1

Note

An example of how to get 23 coins in the first testcase is as follows:

- $a = [3, 1, 4, -1, -5, \color{red}{-9}] \xrightarrow{i=6} a = [3, 1, 4, -1, -5]$, and get 9 coins.
- $a = [\color{red}{3}, 1, 4, -1, -5] \xrightarrow{i=1} a = [1, 4, -1, -5]$, and get 3 coins.
- $a = [\color{red}{1}, 4, -1, -5] \xrightarrow{i=3} a = [4, -1, -5]$, and get 1 coin.
- $a = [4, -1, \color{red}{-5}] \xrightarrow{i=2} a = [4, -1]$, and get 5 coins.
- $a = [4, \color{red}{-1}] \xrightarrow{i=1} a = [4]$, and get 1 coin.
- $a = [\color{red}{4}] \xrightarrow{i=1} a = []$, and get 4 coins.

After all the operations, you have 23 coins.

An example of how to get 40 coins in the second testcase is as follows:

- $a = [-10, -3, -17, \color{red}{1}, 19, 20] \xrightarrow{i=4} a = [19, 20]$, and get 1 coin.
- $a = [\color{red}{19}, 20] \xrightarrow{i=1} a = [20]$, and get 19 coins.
- $a = [\color{red}{20}] \xrightarrow{i=1} a = []$, and get 20 coins.

After all the operations, you have 40 coins.