

Problem E. Coins

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 512 mebibytes

Niwango and Nikomoba play the following game.

N coins are arranged in a row, and they are numbered 1 through N . Initially, odd-indexed coins are heads up, and even-indexed coins are tails up. The value of the coin i is S_i .

The game consists of $N - 1$ turns. The turns are numbered 1 through $N - 1$. Niwango plays odd-indexed turns, and Nikomoba plays even-indexed turns. In the turn i , the player can flip at most one of the coins i and $i + 1$. (The player is allowed not to flip any coins).

After the $N - 1$ turns, Niwango takes all heads-up coins and Nikomoba takes all tails-up coins. The score of a player is the sum of values of all the coins he takes. Compute Niwango's score when both players play optimally.

Also, there will be Q updates of coin values. In the i -th update, the value of coin P_i decreases by D_i . This update applies for all later updates; for example, after the second update, both of the first two updates are applied. For each i , compute Niwango's score, assuming that they start playing the game after the i -th update.

Input

N
 $S_1 \dots S_N$
 Q
 $P_1 D_1$
 \vdots
 $P_Q D_Q$

- $2 \leq N \leq 200000$
- $1 \leq S_i \leq 10^9$
- $0 \leq Q \leq 200000$
- $1 \leq P_i \leq N$
- $1 \leq D_i$
- At any time, each coin has a positive value.

Output

Print $Q + 1$ lines. In the i -th line print Niwango's score when they start playing the game after $(i - 1)$ updates of coin values.

Examples

standard input	standard output
4 1 2 3 4 1 4 3	7 5
8 3 1 4 1 5 9 2 6 5 3 3 6 6 8 4 1 1 6 2	19 16 16 12 11 11