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G - Takahashi's Expectation 2

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 625 points

Problem Statement

Takahashi will receive some presents from now on.

He has an integer parameter called mood, and the mood changes each time he receives a present. Each present has an integer parameter called value P , and Takahashi's mood changes according to this parameter as follows:

- If the value P of the received present is greater than or equal to the mood value, he is delighted with the present, and the mood increases by A .
- If the value P of the received present is less than the mood value, he is disappointed with the present, and the mood decreases by B .

Initially, there are N presents that Takahashi is scheduled to receive, and the value of the i -th present he will receive ($1 \leq i \leq N$) is P_i .

You are given Q queries consisting of two types: addition queries and question queries.

Process all of them in order, and answer all question queries.

The i -th query is represented by two integers T_i , X_i , and it is an addition query if $T_i = 1$, and a question query if $T_i = 2$.

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In an addition query, add a new present with value X_i to the end of the presents to be received.

In a question query, answer the following question:

Find Takahashi's mood after receiving all the presents he is scheduled to receive when his mood is initially X_i .

Constraints

- $1 \leq N \leq 2 \times 10^5$
- $1 \leq A \leq 10^9$
- $1 \leq B \leq 10^9$
- $-10^9 \leq P_i \leq 10^9$ ($1 \leq i \leq N$)
- $1 \leq Q \leq 2 \times 10^5$
- $T_i = 1$ or $T_i = 2$ ($1 \leq i \leq Q$)
- There exists an integer i ($1 \leq i \leq Q$) such that $T_i = 2$.
- If $T_i = 1$, then $-10^9 \leq X_i \leq 10^9$. ($1 \leq i \leq Q$)
- If $T_i = 2$, then $-10^{12} \leq X_i \leq 10^{12}$. ($1 \leq i \leq Q$)
- All input values are integers.

Input

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

```
N A B
P_1 P_2 ... P_N
Q
T_1 X_1
T_2 X_2
⋮
T_Q X_Q
```

Output

Let q be the number of question queries, and print q lines. The i -th line ($1 \leq i \leq q$) should contain the answer to the i -th question query.

```
4 31 41
59 -26 53 58
5
2 9
1 79
2 32
1 38
2 462
```

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Sample Output 1

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```
61
43
216
```

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Initially, the values of the presents Takahashi is scheduled to receive are 59, −26, 53, 58, in the order he will receive them.

The five queries are as follows:

- When his mood is initially 9, his mood changes as $9 \rightarrow 40 \rightarrow -1 \rightarrow 30 \rightarrow 61$ each time he receives a present, so print the final mood 61.
- A present with value 79 is added to the presents he is scheduled to receive, and the values of the presents he is scheduled to receive become 59, −26, 53, 58, 79.
- When his mood is initially 32, his mood changes as $32 \rightarrow 63 \rightarrow 22 \rightarrow 53 \rightarrow 84 \rightarrow 43$ each time he receives a present, so print the final mood 43.
- A present with value 38 is added to the presents he is scheduled to receive, and the values of the presents he is scheduled to receive become 59, −26, 53, 58, 79, 38.
- When his mood is initially 462, his mood changes as $462 \rightarrow 421 \rightarrow 380 \rightarrow 339 \rightarrow 298 \rightarrow 257 \rightarrow 216$ each time he receives a present, so print the final mood 216.

Sample Input 2

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```
3 1000000000 1000000000
1000000000 0 -1000000000
3
2 -10000000000000
2 0
2 10000000000000
```

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Sample Output 2

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```
-997000000000
-1000000000
997000000000
```

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Note that the absolute value of the input and the values to be output may be 2^{32} or greater.

Sample Input 3

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```
20 8489 1428
6312 -9511 1048 -5301 -2588 -7097 -3342 5209 7493 3378 -5300 6592 7862 -8118 8109 1116 5
10
1 1694
2 -9723
2 -5195
2 -1384
1 1149
2 9845
2 -7720
2 8329
2 -4652
2 -5672
```

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Sample Output 3

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```
9874
14402
8296
8180
10449
6664
3600
12497
```

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'#telegram)

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