Problem E. Médio

Time limit 2000 ms
Mem limit 262144 kB

You are given n of integers $a_1, a_2, \ldots, a_n$. Process q queries of two types:

- query of the form "`0` x_j": add the value x_j to all even elements of the array a,
- query of the form "`1` x_j": add the value x_j to all odd elements of the array a.

Note that when processing the query, we look specifically at the odd/even value of a_i, not its index.

After processing each query, print the sum of the elements of the array a.

Please note that the answer for some test cases won't fit into 32-bit integer type, so you should use at least 64-bit integer type in your programming language (like `long long` for C++).

Input

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

The descriptions of the test cases follow.

The first line of each test case contains two integers n and q ($1 \le n, q \le 10^5$) — the length of array a and the number of queries.

The second line of each test case contains exactly n integers: $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^9$) — elements of the array a.

The following q lines contain queries as two integers $type_j$ and x_j ($0 \le type_j \le 1, 1 \le x_j \le 10^4$).

It is guaranteed that the sum of values n over all test cases in a test does not exceed 10^5.
Similarly, the sum of values q over all test cases does not exceed 10^5.

Output

For each test case, print q numbers: the sum of the elements of the array a after processing a query.

Sample 1

Input	Output
4 1 1 1 1 1 3 3 1 2 4 0 2 1 3 0 5 6 7 1 3 2 4 10 48 1 6 0 5 0 4 0 5 1 3 0 12 0 1 6 7 1000000000 1000000000 1000000000 11 15 17 0 17 1 10000 1 51 0 92 0 53 1 16 0 1	2 11 14 29 80 100 100 100 118 190 196 3000000094 3000060094 3000060400 3000060952 3000061270 3000061366 3000061366

Note

In the first test case, the array $a = [2]$ after the first query.

In the third test case, the array a is modified as follows: $[1, 3, 2, 4, 10, 48] \to [7, 9, 2, 4, 10, 48] \to [7, 9, 7, 9, 15, 53] \to [7, 9, 7, 9, 15, 53] \to [10, 12, 10, 12, 18, 56] \to [22, 24, 22, 24, 30, 68] \to [23, 25, 23, 25, 31, 69]$.