CHT Practice

You can test you CHT implementation in this problem. Problem is simple. You have to solve some queries in the form -

1 m b: Add a function **f(x) = mx + b** in a set.
2 x: For all existing funciton in the set, find the maximum/minimum value of **{ $f_i(x)$) }.**

You also have some special constrians on the inputs. In a dataset, you have either of the four cases for all queries -

1. $m_i > m_{i+1}$, and all queries are for minimum.
2. $m_i > m_{i+1}$, and all queries are for maximum.
3. $m_i < m_{i+1}$, and all queries are for minimum.
4. $m_i < m_{i+1}$, and all queries are for maximum.

Furthermore, all quereis of second kind will obey this - $x_i < x_{i+1}$.

Input

In the first line, you will have a number **Q <= 10^5,** the number of queries. Then a integer **a,** where **a** denotes the case number (from problem statement), which you'll need to handle in this dataset.

Next **Q** lines will contain a number **t** first, if it is **1** then another two integers will be given **m b,** where |**m**|, |**b**|<= **10^9.** Then you need to add the function **f(x) = mx + b** into set.
if **t** is **2**, then you will be given a number **|x| <= 10^9**, you need to answer the query as described.

Output

For each query of second type, print the desired answer in a seperate line.

Example

Input:
5 1
1 5 1
1 4 -1
1 3 -2
2 -1
2 3

Output:
-5
7