You are given an array of N elements (N <= 100000). In a test case there can be as many as `C` operations. (Note that there can be multiple test cases)

The following operations are expected to be performed on the given array.

– Add `x` to all the values in the given range (inclusive). By default all the elements in the array are initialized to 0.
– Return the `sum` of all the values in the given range (inclusive).

Example:

* 0 p q v – you have to add v to all numbers in the range of p to q (inclusive), where p and q are two indexes of the array. (1 <= p, q <= N and 1 <= v <= 10^7)

* 1 p q – output a line containing a single integer which is the sum of all the array elements between p and q (inclusive) (1 <= p, q <= N and 1 <= v <= 10^7)

Input
In the first line you'll be given T, number of test cases.

Each test case will start with N and C.
After that you'll be given C commands in the format as mentioned above.

Output
Print the answers of the queries.

Example
Input:
1
8 6
0 2 4 26
0 4 8 80
0 4 5 20
1 8 8
0 5 7 14
1 4 8

Output:
80
508

Explanation:

1 — Number of tests cases
8 6 — Array with 8 elements and 6 queries following.
0 2 4 26 — Add 26 to all the values in the inclusive range (2, 4)
1 8 8 — Sum of all the elements in the range (8, 8)