Problem U. Mr. Perfectly Fine

Time limit 2000 ms
Mem limit 262144 kB

Victor wants to become "*Mr. Perfectly Fine*". For that, he needs to acquire a certain set of skills. More precisely, he has 2 skills he needs to acquire.

Victor has n books. Reading book i takes him m_i minutes and will give him some (possibly none) of the required two skills, represented by a binary string of length 2.

What is the minimum amount of time required so that Victor acquires all of the two skills?

Input

The input consists of multiple test cases. The first line contains an integer t ($1 \leq t \leq 1000$) — the number of test cases. The description of the test cases follows.

The first line of each test case contains an integer n ($1 \leq n \leq 2 \cdot 10^5$) — the number of books available.

Then n lines follow. Line i contains a positive integer m_i ($1 \leq m_i \leq 2 \cdot 10^5$) and a binary string of length 2, where $s_{i1} = 1$ if reading book i acquires Victor skill 1, and $s_{i1} = 0$ otherwise, and $s_{i2} = 1$ if reading book i acquires Victor skill 2, and $s_{i2} = 0$ otherwise.

It is guaranteed that the sum of n over all test cases doesn't exceed $2 \cdot 10^5$.

Output

For each test case, output a single integer denoting the minimum amount of minutes required for Victor to obtain both needed skills and -1 in case it's impossible to obtain the two skills after reading any amount of books.

Examples

Input	Output
6 4 2 00 3 10 4 01 4 00 5 3 01 3 01 5 01 2 10 9 10 1 5 11 3 9 11 8 01 7 10 6 4 01 6 01 7 01 8 00 9 01 1 00 4 8 00 9 10 9 11 8 11	7 5 5 9 -1 8

Note

In the first test case, we can use books 2 and 3, with a total amount of minutes spent equal to $3 + 4 = 7$.

In the second test case, we can use the books 1 and 4, with a total amount of minutes spent equal to $3 + 2 = 5$.

In the third test case, we have only one option and that is reading book 1 for a total amount of minutes spent equal to 5.