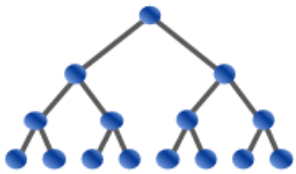

## USACO 2021 DECEMBER CONTEST, PLATINUM
## PROBLEM 2. PAIRED UP

Return to Problem List

Time Remaining: **3 hrs, 59 min, 25 sec**

**Not submitted yet**

English (en)

There are a total of $N$ ($1 \leq N \leq 5000$) cows on the number line, each of which is a Holstein or a Guernsey. The breed of the $i$-th cow is given by $b_i \in \{H, G\}$, the location of the $i$-th cow is given by $x_i$ ($0 \leq x_i \leq 10^9$), and the weight of the $i$-th cow is given by $y_i$ ($1 \leq y_i \leq 10^5$).

At Farmer John's signal, some of the cows will form pairs such that

- Every pair consists of a Holstein $h$ and a Guernsey $g$ whose locations are within $K$ of each other ($1 \leq K \leq 10^9$); that is, $|x_h - x_g| \leq K$.
- Every cow is either part of a single pair or not part of a pair.
- The pairing is *maximal;* that is, no two unpaired cows can form a pair.

It's up to you to determine the range of possible sums of weights of the unpaired cows. Specifically,

- If $T = 1$, compute the minimum possible sum of weights of the unpaired cows.
- If $T = 2$, compute the maximum possible sum of weights of the unpaired cows.

**INPUT FORMAT (input arrives from the terminal / stdin):**

The first input line contains $T$, $N$, and $K$.

Following this are $N$ lines, the $i$-th of which contains $b_i, x_i, y_i$. It is guaranteed that $0 \leq x_1 < x_2 < \cdots < x_N \leq 10^9$.

**OUTPUT FORMAT (print output to the terminal / stdout):**

The minimum or maximum possible sum of weights of the unpaired cows.

**SAMPLE INPUT:**

```
2 5 4
G 1 1
H 3 4
G 4 2
H 6 6
H 8 9
```

**SAMPLE OUTPUT:**

```
16
```

Cows $2$ and $3$ can pair up because they are at distance $1$, which is at most $K = 4$. This pairing is maximal, because cow $1$, the only remaining Guernsey, is at distance $5$ from cow $4$ and distance $7$ from cow $5$, which are more than $K = 4$. The sum of weights of unpaired cows is $1 + 6 + 9 = 16$.

**SAMPLE INPUT:**

```
1 5 4
G 1 1
H 3 4
G 4 2
H 6 6
H 8 9
```

**SAMPLE OUTPUT:**

6

Cows $1$ and $2$ can pair up because they are at distance $2 \leq K = 4$, and cows $3$ and $5$ can pair up because they are at distance $4 \leq K = 4$. This pairing is maximal because only cow $4$ remains. The sum of weights of unpaired cows is the weight of the only unpaired cow, which is simply $6$.

**SAMPLE INPUT:**

```
2 10 76
H 1 18
H 18 465
H 25 278
H 30 291
H 36 202
G 45 96
G 60 375
G 93 941
G 96 870
G 98 540
```

**SAMPLE OUTPUT:**

```
1893
```

The answer to this example is $18 + 465 + 870 + 540 = 1893$.

**SCORING:**

- Test cases 4-7 satisfy $T = 1$.
- Test cases 8-14 satisfy $T = 2$ and $N \leq 300$.
- Test cases 15-22 satisfy $T = 2$.

****Note: the memory limit for this problem is 512MB, twice the default.****

Problem credits: Benjamin Qi

**Language:** C

**Source File:** Choose File No file chosen

Submit Solution