Colored Loop

(based on a Google Code Jam 2011 qualifier problem)

You are given a bag containing n rope segments. Each segment is either blue or red and has a certain length. Your goal is to build the longest loop by tying rope segments together in alternate colors. That is, each blue segment must be tied at both ends with a red segment, and vice-versa a red segment must be tied at both ends with a blue segment. A knot that ties two segments together effectively reduces the length of both segments by 0.5. So, a segment of length 1 can be part of a loop, but would not add any length.

Input

The first line of input contains the number of test cases, $T < 100$. Then T test cases follow. For each test case there will be one line containing the value n, the number of rope segments in the bag, followed by a line containing n pairs ℓ c, where ℓ is the length of a segment and c is a single character, '`B`' or '`R`', indicating the color. Lenghts and color characters are all separated by spaces. You may assume that $1 \leq n \leq 1000$ and $1 \leq \ell \leq 100$.

Output

For each test case t, with t going from 1 to T, output one line containing "`Case #`t`: `" followed by the maximum length of the rope loop that can be generated with the rope segments provided.

Sample input 1

```
4
1
5 B
4
6 R 1 B 7 R 3 B
7
5 B 4 R 3 R 2 R 5 R 4 R 3 R
2
20 B 20 R
```

Sample output 1

```
Case #1: 0
Case #2: 13
Case #3: 8
Case #4: 38
```

Limits

Time limit is 1 second.

Memory limit is 256 megabytes.