# Problem D: Portalball

Portalball is a futuristic sport in which a ball is dropped from rest (i.e. zero velocity), and onlookers bet on where the ball will come to rest next. In this description, we identify the ball's position with its center of mass, so we can treat it as a point.

Portals come in pairs. If the ball goes through a portal at velocity v, it emerges from its twin at velocity either v or $-v$ depending on whether the two portals have matching or mirroring orientations, respectively. When not going through portals, the ball is accelerated by a controlled constant gravitational field by $980cm/s^2$ in the negative y direction. In all test cases, it is guaranteed the ball never travels slower than 40 cm/s when it's within a millimetre of any portal.

The last sample input
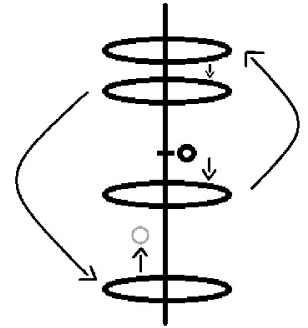
Input Specification:

The input contains up to 100 test cases. The first line of each case contains a single integer N ($1 \leq N \leq 70,000$). Each of the next N lines describes a pair of portals by a space-separated list y_1, y_2, o. Integer y_i ($0 < |y_i| < 700,000,000$) is the position in centimetres of the i'th portal in the pair, relative to where the ball is dropped. All portal positions are distinct. o is either '+' or '-' (quotes for clarity) according to whether the portals have matching or mirroring orientations, respectively. End of input is marked by a 0 on its own line. At most 5 cases will have $N > 1000$.

Output Specification:

For each test case, print the ball's position the next time its velocity becomes zero, rounded to the nearest integer, on on a single line following precisely the format of the sample output. If the ball never again comes to rest, print the string FOREVER FALLING instead.

Sample Input:

```
1
-5 15 +
1
-5 15 -
2
-5 15 +
10 -20 -
0
```

Sample Output:

```
FOREVER FALLING
STOPS AT 20 cm
STOPS AT -10 cm
```

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