



Long Long Strings

To store DNA sequences your company has developed a general *LongLongString* class that can store strings with a theoretically unlimited number of characters. Individual character can be referenced by index. The leftmost character is at position 1. The class can execute simple programs with three basic operations:

- **insert**(*p*, *c*) - inserts the character *c* at position *p*. All characters past *p* are pushed to the right by 1.
- **delete**(*p*) – deletes the character at position *p*. All character past *p* are pushed to the left by 1.
- **end** – ends the program

Your job is two write a program that compares two string editing programs and determines if they are *different*. They are *not different* if, when applied to **any** string, they produce identical results. Otherwise, they are *different*.

For example:

- [delete(1) delete(2) end] and [delete(3) delete(1) end] are *not different*
- [delete(2) delete(1) end] and [delete(1) delete(2) end] are *different*.
- [insert(1,X) delete(1) end] and [end] are *not different*.
- [insert(14,B) insert(14,A) end] and [insert(14,A) insert(15,B) end] are *not different*
- [insert(14,A) insert(15,B) end] and [insert(14,B) insert(15,A) end] are *different*.

Input

Each input will consist of a single test case. Note that your program may be run multiple times on different inputs. Each test case will consist of exactly two programs, one after the other. Each program will end with an **end** statement, and each will be no longer than **2,000** instructions. Each line of each program will consist of exactly one of:

I *p* *c*

or

D *p*

or

E

Where *p* ($1 \leq p \leq 10^{10}$) is a position in the string, and *c* is a single capital letter (**A..Z**). **I** means **insert**, **D** means **delete**, and **E** means **end**.



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Output

Output a single integer, **1** if the programs are *different*, and **0** if they are *not different*.

Sample Input

Sample Output

D 1 D 2 E D 3 D 1 E	0
D 2 D 1 E D 1 D 2 E	1
I 1 X D 1 E E	0
I 14 B I 14 A E I 14 A I 15 B E	0
I 14 A I 15 B E I 14 B I 15 A E	1