

Instruction Decoder

Mathews uses a brand new 16-bit instruction processor. (Yeah i am being sarcastic!). It has one register (say R) and it supports two instructions:

- ADD X; Impact: $R = (R + X) \bmod 65536$
- MUL X; Impact: $R = (R * X) \bmod 65536$
- [For both instructions $0 \leq X \leq 65535$]

Mathews sees a segment of code, but does not know what value the register had before the code was being executed. How many possible values can the register have after the segment completed execution?

Input Format:

The input file consists of multiple testcases.

The first line of each testcase contains one integer, **N**. ($1 \leq N \leq 100,000$).

The following **N** lines contain one instructions each.

Input terminates with a line containing $N=0$, which must not be processed.

Output Format:

For each testcase print one integer in a single line, denoting the number of different values the register can take after code execution.

Sample Input:

```
1
ADD 3
1
MUL 0
5
MUL 3
ADD 4
MUL 5
ADD 3
MUL 2
8
ADD 32
MUL 5312
ADD 7
MUL 7
ADD 32
MUL 5312
ADD 7
MUL 7
0
```

Sample Output:

```
65536
1
32768
16
```