

CS1020E: DATA STRUCTURES AND ALGORITHMS I

Lab 9 – Math Again

(Week 13, starting 07 November 2016)

Problem Description

Given 5 positive integers not more than 9 in array $\mathbf{A} = [A_0, A_1, A_2, A_3, A_4]$, decide if it is possible to evaluate the following special mathematical expression below such that the result is Steven's favourite number 7.

$$(((A_{\pi(0)} o_1 A_{\pi(1)}) o_2 A_{\pi(2)}) o_3 A_{\pi(3)}) o_4 A_{\pi(4)}$$

For this problem, π is a permutation of $\{0, 1, 2, 3, 4\}$ (so you have up to $5! = 120$ permutations here) and $o_i \in \{+, -, *\}$ for $1 \leq i \leq 4$ (so you have another $3^4 = 81$ possibilities for each permutation).

For example, if $\mathbf{A} = [1\ 1\ 1\ 1\ 1]$, the answer is impossible as none of the $5! * 3^4 = 120 * 81 = 9\ 720$ possible permutations of \mathbf{A} and combinations of o will give us value 7.

But if $\mathbf{A} = [1\ 1\ 1\ 1\ 2]$, the answer is possible, e.g. we can swap the last two integers A_3 and A_4 and do $++*+$, i.e. $((1+1)+1)*2+1 = 3*2+1 = 7$.

Input

There can be up to 300 000 test cases in this problem.

Each test case consists of a line with 5 small positive integers that are not more than 9 in one line.

The input is terminated with 5 zeroes.

Output

For each test case, please output "Y"/"N" (without the quotes) in one line for possible/impossible cases, respectively.

Input	Output
1 1 1 1 1	N
1 1 1 1 2	Y
0 0 0 0 0	

Submission

Your source file should be named `mathagain.cpp`

Note about Last Lab 9

As this is the last Lab 9, there is no skeleton file and there is no partial mark for easier subtasks.

You can use this Lab 9 (up to 1%) to override any of your Lab 1-8 scores that is not full marks, if you choose to do so...

- End of Lab 9 -