

# Roll or Push

## Problem code: HS09ROL

You have to transport a cube by a distance of  $S$  meters. The edge of the cube is  $A$  meters long and the cube weighs  $M$  kilograms.  $S$  is a multiple of  $A$ . One can proceed in two ways:

1. by rolling the box along its edges (fighting gravity)
2. by pushing it along one of its square faces (fighting friction)

You are given the coefficient of friction  $F$  and have to decide which way is better.

## Input

Standard input contains  $N$  ( $1 \leq N \leq 60\,000$ ) lines, each containing four values  $A, M, S, F$  ( $10 \leq A, M, S \leq 30\,000$ ;  $0.001 \leq F \leq 1.000$ ) separated by spaces. In line  $N+1$  there are four zeros separated by spaces. Do not process this test case.

## Output

Write  $N$  lines to standard output. Each should contain a single number 1 if less work is done when rolling the box and 2 if less work is done when pushing it. You are guaranteed that the difference between the works counted in both ways will never be closer than 1% of the larger of the considered values. You can assume the following value of gravitational acceleration:  $g=9.80665$ .

## Example

**Input:** 10 50 10 0.220 40 60 0.330 100 30 0.40 0 0 0.0 **Output:** 211

## Scoring

For solving this problem you will score **10** points.

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Added by: Adam Dzedzej

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Time limit: 1s

Source  
limit: 50000B

Languages: SED C99 strict C++ 4.0.0-8 C++ 4.3.2 TCL SCALA NICE NEM BASH PHP SCM guile  
LISP sbcl LISP clisp ERL TECS TEXT DOC PDF PS PERL 6 JS

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