

# Roll or Push

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 0.2
20 40 60 0.3
30 100 30 0.4
0 0 0 0.0
```

### Output:

```
2
1
1
```

## Scoring

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