Codeforces Alpha Round #21 (Codeforces format)

A. Jabber ID

time limit per test: 0.5 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Jabber ID on the national Berland service «Babber» has a form `<username>@<hostname>[/resource]`, where

- `<username>` — is a sequence of Latin letters (lowercase or uppercase), digits or underscores characters «_», the length of `<username>` is between 1 and 16, inclusive.
- `<hostname>` — is a sequence of word separated by periods (characters «.»), where each word should contain only characters allowed for `<username>`, the length of each word is between 1 and 16, inclusive. The length of `<hostname>` is between 1 and 32, inclusive.
- `<resource>` — is a sequence of Latin letters (lowercase or uppercase), digits or underscores characters «_», the length of `<resource>` is between 1 and 16, inclusive.

The content of square brackets is optional — it can be present or can be absent.

There are the samples of correct Jabber IDs: `mike@codeforces.com`, `007@en.codeforces.com/contest`.

Your task is to write program which checks if given string is a correct Jabber ID.

Input
The input contains of a single line. The line has the length between 1 and 100 characters, inclusive. Each characters has ASCII-code between 33 and 127, inclusive.

Output
Print YES or NO.

Examples

input
mike@codeforces.com
output
YES

input
john.smith@codeforces.ru/contest.icpc/12
output
NO

B. Intersection

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given two set of points. The first set is determined by the equation $A_1x + B_1y + C_1 = 0$, and the second one is determined by the equation $A_2x + B_2y + C_2 = 0$.

Write the program which finds the number of points in the intersection of two given sets.

Input

The first line of the input contains three integer numbers A_1, B_1, C_1 separated by space. The second line contains three integer numbers A_2, B_2, C_2 separated by space. All the numbers are between -100 and 100, inclusive.

Output

Print the number of points in the intersection or -1 if there are infinite number of points.

Examples

input
1 1 0 2 2 0
output
-1

input
1 1 0 2 -2 0
output
1

C. Stripe 2

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

Once Bob took a paper stripe of n squares (the height of the stripe is 1 square). In each square he wrote an integer number, possibly negative. He became interested in how many ways exist to cut this stripe into three pieces so that the sum of numbers from each piece is equal to the sum of numbers from any other piece, and each piece contains positive integer amount of squares. Would you help Bob solve this problem?

Input

The first input line contains integer n ($1 \le n \le 10^5$) — amount of squares in the stripe. The second line contains n space-separated numbers — they are the numbers written in the squares of the stripe. These numbers are integer and do not exceed 10000 in absolute value.

Output

Output the amount of ways to cut the stripe into three non-empty pieces so that the sum of numbers from each piece is equal to the sum of numbers from any other piece. Don't forget that it's allowed to cut the stripe along the squares' borders only.

Examples

input
4 1 2 3 3
output
1

input
5 1 2 3 4 5
output
0

D. Traveling Graph

time limit per test: 0.5 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

You are given undirected weighted graph. Find the length of the shortest cycle which starts from the vertex 1 and passes throught all the edges at least once. Graph may contain multiply edges between a pair of vertices and loops (edges from the vertex to itself).

Input

The first line of the input contains two integers n and m ($1 \le n \le 15, 0 \le m \le 2000$), n is the amount of vertices, and m is the amount of edges. Following m lines contain edges as a triples x, y, w ($1 \le x, y \le n, 1 \le w \le 10000$), x, y are edge endpoints, and w is the edge length.

Output

Output minimal cycle length or -1 if it doesn't exists.

Examples

input
3 3 1 2 1 2 3 1 3 1 1
output
3

input
3 2 1 2 3 2 3 4
output
14