Codeforces Beta Round #70 (Div. 2)

A. Haiku

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Haiku is a genre of Japanese traditional poetry.

A haiku poem consists of 17 syllables split into three phrases, containing 5, 7 and 5 syllables correspondingly (the first phrase should contain exactly 5 syllables, the second phrase should contain exactly 7 syllables, and the third phrase should contain exactly 5 syllables). A haiku masterpiece contains a description of a moment in those three phrases. Every word is important in a small poem, which is why haiku are rich with symbols. Each word has a special meaning, a special role. The main principle of haiku is to say much using a few words.

To simplify the matter, in the given problem we will consider that the number of syllable in the phrase is equal to the number of vowel letters there. Only the following letters are regarded as vowel letters: "a", "e", "i", "o" and "u".

Three phases from a certain poem are given. Determine whether it is haiku or not.

Input

The input data consists of three lines. The length of each line is between 1 and 100, inclusive. The i-th line contains the i-th phrase of the poem. Each phrase consists of one or more words, which are separated by one or more spaces. A word is a non-empty sequence of lowercase Latin letters. Leading and/or trailing spaces in phrases are allowed. Every phrase has at least one non-space character. See the example for clarification.

Output

Print "YES" (without the quotes) if the poem is a haiku. Otherwise, print "NO" (also without the quotes).

Examples

input
on codeforces beta round is running   a rustling of keys
output
YES

input
how many gallons of edo s rain did you drink cuckoo
output
NO

B. Easter Eggs

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

The Easter Rabbit laid n eggs in a circle and is about to paint them.

Each egg should be painted one color out of 7: red, orange, yellow, green, blue, indigo or violet. Also, the following conditions should be satisfied:

- Each of the seven colors should be used to paint at least one egg.
- Any four eggs **lying sequentially** should be painted different colors.

Help the Easter Rabbit paint the eggs in the required manner. We know that it is always possible.

Input

The only line contains an integer n — the amount of eggs ($7 \le n \le 100$).

Output

Print one line consisting of n characters. The i-th character should describe the color of the i-th egg in the order they lie in the circle. The colors should be represented as follows: "R" stands for red, "O" stands for orange, "Y" stands for yellow, "G" stands for green, "B" stands for blue, "I" stands for indigo, "V" stands for violet.

If there are several answers, print any of them.

Examples

input
8
output
ROYGRBIV

input
13
output
ROYGBIVGBIVYG

Note

The way the eggs will be painted in the first sample is shown on the picture:

C. Beaver Game

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

Two beavers, Timur and Marsel, play the following game.

There are n logs, each of exactly m meters in length. The beavers move in turns. For each move a beaver chooses a log and gnaws it into some number (more than one) of **equal** parts, the length of each one is expressed by an integer and is no less than k meters. Each resulting part is also a log which can be gnawed in future by any beaver. The beaver that can't make a move loses. Thus, the other beaver wins.

Timur makes the first move. The players play in the optimal way. Determine the winner.

Input

The first line contains three integers n, m, k ($1 \le n, m, k \le 10^9$).

Output

Print "`Timur`", if Timur wins, or "`Marsel`", if Marsel wins. You should print everything without the quotes.

Examples

input
1 15 4
output
Timur

input
4 9 5
output
Marsel

Note

In the first sample the beavers only have one log, of 15 meters in length. Timur moves first. The only move he can do is to split the log into 3 parts each 5 meters in length. Then Marsel moves but he can't split any of the resulting logs, as $k = 4$. Thus, the winner is Timur.

In the second example the beavers have 4 logs 9 meters in length. Timur can't split any of them, so that the resulting parts possessed the length of not less than 5 meters, that's why he loses instantly.

D. Archer's Shot

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

A breakthrough among computer games, "Civilization XIII", is striking in its scale and elaborate details. Let's take a closer look at one of them.

The playing area in the game is split into congruent cells that are regular hexagons. The side of each cell is equal to 1. Each unit occupies exactly one cell of the playing field. The field can be considered infinite.

Let's take a look at the battle unit called an "Archer". Each archer has a parameter "shot range". It's a positive integer that determines the radius of the circle in which the archer can hit a target. The center of the circle coincides with the center of the cell in which the archer stays. A cell is considered to be under the archer's fire if and only if all points of this cell, including border points are located inside the circle or on its border.

The picture below shows the borders for shot ranges equal to 3, 4 and 5. The archer is depicted as A.

Find the number of cells that are under fire for some archer.

Input

The first and only line of input contains a single positive integer k — the archer's shot range ($1 \le k \le 10^6$).

Output

Print the single number, the number of cells that are under fire.

Please do not use the `%lld` specificator to read or write 64-bit integers in C++. It is preferred to use the `cout` stream (also you may use the `%I64d` specificator).

Examples

input
3
output
7

input
4
output
13

input
5
output
19

E. Evacuation

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

They've screwed something up yet again... In one nuclear reactor of a research station an uncontrolled reaction is in progress and explosion which will destroy the whole station will happen soon.

The station is represented by a square $n \times n$ divided into 1×1 blocks. Each block is either a reactor or a laboratory. There can be several reactors and exactly one of them will explode soon. The reactors can be considered impassable blocks, but one can move through laboratories. Between any two laboratories, which are in adjacent blocks, there is a corridor. Blocks are considered adjacent if they have a common edge.

In each laboratory there is some number of scientists and some number of rescue capsules. Once the scientist climbs into a capsule, he is considered to be saved. Each capsule has room for not more than one scientist.

The reactor, which is about to explode, is damaged and a toxic coolant trickles from it into the neighboring blocks. The block, which contains the reactor, is considered infected. Every minute the coolant spreads over the laboratories through corridors. If at some moment one of the blocks is infected, then the next minute all the neighboring laboratories also become infected. Once a lab is infected, all the scientists there that are not in rescue capsules die. The coolant does not spread through reactor blocks.

There are exactly t minutes to the explosion. Any scientist in a minute can move down the corridor to the next lab, if it is not infected. On any corridor an unlimited number of scientists can simultaneously move in both directions. It is believed that the scientists inside a lab moves without consuming time. Moreover, any scientist could get into the rescue capsule instantly. It is also believed that any scientist at any given moment always has the time to perform their actions (move from the given laboratory into the next one, or climb into the rescue capsule) before the laboratory will be infected.

Find the maximum number of scientists who will be able to escape.

Input

The first line contains two integers n and t ($2 \le n \le 10$, $1 \le t \le 60$). Each of the next n lines contains n characters. These lines describe the scientists' locations. Then exactly one empty line follows. Each of the next n more lines contains n characters. These lines describe the rescue capsules' locations.

In the description of the scientists' and the rescue capsules' locations the character "Y" stands for a properly functioning reactor, "Z" stands for the malfunctioning reactor. The reactors' positions in both descriptions coincide. There is exactly one malfunctioning reactor on the station. The digits "0" - "9" stand for the laboratories. In the description of the scientists' locations those numbers stand for the number of scientists in the corresponding laboratories. In the rescue capsules' descriptions they stand for the number of such capsules in each laboratory.

Output

Print a single number — the maximum number of scientists who will manage to save themselves.

Examples

input
3 3 1YZ 1YY 100 0YZ 0YY 003
output
2

input
4 4 Y110 1Y1Z 1Y0Y 0100 Y001 0Y0Z 0Y0Y 0005
output
3

Note

In the second sample the events could take place as follows: