Problem A. Alien

Input file:	`alien.in`
Output file:	`alien.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

Once upon a time after winning another competition at KBTU, Bakhytzhan, Askar and Artem walked throw the Old Square. When they found some interesting rectangle lines on the asphalt, they stopped and screamed out "R tree". They screamed so loud that all people around them screamed "ALIENS". Bakhytzhan knew that these lines were resigned by aliens from the Moon which landed on the square the night before. Now they want to know is it true that some alien's ship landed on the place where Bakhytzhan stopped.

Input

The first line of the input file contains a single integer number n – the number of alien's ships ($1 \le n \le 10\,000$). The second line of the input file contains a pair of integer numbers – Bakhytzhan's coordinates – b1 and b2 ($-10\,000 \le b1, b2 \le 10\,000$). The following n lines describe n alien's ships. Each alien's ship is described by 2 pairs of integer coordinates: first pair lx and ly ($-10\,000 \le lx, ly \le 10\,000$) describes bottom left corner of the ship and the second pair hx and hy ($-10\,000 \le hx, hy \le 10\,000$) describes top right corner of the ship on a Cartesian plane.

Output

The output file must contain "Yes" if any alien's ship landed on the place where Bakhytzhan stopped, and "No" otherwise.

Example

alien.in	alien.out
2 2 2 1 1 4 4 5 5 7 7	Yes

Problem B. B-Matrix

Input file:	`bmartix.in`
Output file:	`bmatrix.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

Given a binary matrix having m lines and n columns (the entries in the matrix are either 0 or 1), you must determine the maximum area which may be covered using two rectangles that contain only entries having the value 0.

Input

The first line of the input file contains two integers m and n, separated by a single blank character, representing the dimensions of the matrix. Each of the following m lines contains n numbers (which are not separated by blank characters) having the values 0 or 1.

It is guaranteed that $0 \leq n, m \leq 200$

Output

The output file must contain a single number representing the maximum area which may be covered with two rectangles that contain only entries having the value 0.

Example

bmartix.in	bmatrix.out
6 8 10000000 10000000 11100011 00100011 00100011 00111111	23

Problem C. Calendar

Input file:	`calendar.in`
Output file:	`calendar.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

Anchik and Chikus enter this year's ACM International Collegiate Programming Contest. Last night, they played the Calendar Game, in celebration of this contest. This game consists of the dates from January 1, 1900 to November 4, 2001, the contest day. The game starts by randomly choosing a date from this interval. Then, the players, Anchik and Chikus, make moves in their turn with Anchik moving first: Anchik, Chikus, Anchik, Chikus, etc. There is only one rule for moves and it is simple: from a current date, a player in his/her turn can move either to the next calendar date or the same day of the next month. When the next month does not have the same day, the player moves only to the next calendar date. For example, from December 19, 1924, you can move either to December 20, 1924, the next calendar date, or January 19, 1925, the same day of the next month. From January 31 2001, however, you can move only to February 1, 2001, because February 31, 2001 is invalid. A player wins the game when he/she exactly reaches the date of November 4, 2001. If a player moves to a date after November 4, 2001, he/she looses the game.

Write a program that decides whether, given an initial date, Anchik, the first mover, has a winning strategy.

For this game, you need to identify leap years, where February has 29 days. In the Gregorian calendar, leap years occur in years exactly divisible by four. So, 1993, 1994, and 1995 are not leap years, while 1992 and 1996 are leap years. Additionally, the years ending with 00 are leap years only if they are divisible by 400. So, 1700, 1800, 1900, 2100, and 2200 are not leap years, while 1600, 2000, and 2400 are leap years.

Input

The input consists of T test cases. The number of test cases (T) is given in the first line of the input file. Each test case is written in a line and corresponds to an initial date. The three integers in a line, $YYYYMMDD$, represent the date of the DD-th day of MM-th month in the year of $YYYY$. Remember that initial dates are randomly chosen from the interval between January 1, 1900 and November 4, 2001.

Output

Print exactly one line for each test case. The line should contain the answer "YES" or "NO" to the question of whether Anchik has a winning strategy against Chikus. Since we have T test cases, your program should output totally T lines of "YES" or "NO".

Example

calendar.in	calendar.out
3 2001 11 3 2001 11 2 2001 10 3	YES NO NO

Problem D. Different Digits

Input file:	`digits.in`
Output file:	`digits.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

Given a positive integer n, your task is to find a positive integer m, which is a multiple of n, and that m contains the least number of different digits when represented in decimal. For example, number 1334 contains three different digits 1, 3 and 4.

Input

The input consists of no more than 50 test cases. Each test case has only one line, which contains a positive integer n ($1 \leq n \leq 65\,536$)

Output

For each test case, you should output one line, which contains m. If there are several possible results, you should output the smallest one. Do not output blank lines between cases.

Example

digits.in	digits.out
7 15 16 101 0	7 555 16 1111

Problem E. Easy work

Input file:	`easy.in`
Output file:	`easy.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

You are working in a "Giigle" software company. The job in this company is very easy, so people don't sit in the office from 9am till 6pm. They come to work at any time, and leave the office at any time. You have a magnetic keys system that keeps the log on all people – when they entered the office, and when they leaved. Your task is to find all people that are in office now.

Input

The first line of the input file contains n — the number of lines in input file ($2 \le n \le 10^6$). Each of the following n lines contain person name and word "enter" if this person is entered, and "leave" otherwise.

Output

Output names of all people that are in office now in anti-lexicographical order.

Example

easy.in	easy.out
4 Baha enter Askar enter Baha leave Artem enter	Askar Artem

Problem F. Find the Sum

Input file:	`find.in`
Output file:	`find.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

Find the sum of all the digits in all the integers between $lowerBound$ and $upperBound$, inclusive.

Input

Input file contains two numbers $lowerBound$ and $upperBound$.
It is guaranteed that $0 \le upperBound \le 2\,000\,000\,000$ and $0 \le lowerBound \le upperBound$.

Output

Output the answer to a problem.

Example

find.in	find.out
0 3	6
24660 308357171	11379854844

Problem G. Game

Input file:	`game.in`
Output file:	`game.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

In the beginning of a game, there are r red chips and g green chips on the desk. Two players A and B move alternately, starting with A and according to the following rules: If it's your move, you choose a color and remove k chips of this color from the desk. However, k must be a divisor of the actual number of chips of the other color. You win if you remove the last chip from the desk. Your task is to find which player can force to win this game.

Input

Input file contains two numbers – r and g ($1 \le r, g \le 10^9$) – separated by a space.

Output

Output file should contain "A player wins" if player A can force game to win and "B player wins" otherwise.

Example

game.in	game.out
2 1	A player wins

Problem H. Hallway

Input file:	`hallway.in`
Output file:	`hallway.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

Consider a rectangular hallway of size mxn. In this hallway there are several pillars having a negligible size. You have to compute the maximum radius of a spherical ball which may pass through the hallway from the west end to the east end. The ball may start from any position on the west end and may arrive at any position on the east end. The hallway is always high enough.

Input

The input file contains on the first line two integers m and n, separated by a single blank character, representing the dimensions of the hallway on the east-west and north-south directions, respectively. The second line contains a single integer k representing the number of pillars in the hallway. Each of the following k lines contains two integers, separated by a single blank character, representing the coordinates of a pillar. It is guaranteed that $0 \leq n, m, k \leq 1000$.
The east-west direction is represented by the first coordinate.

Output

The output file must contain a single number, representing the radius of the largest spherical ball which may pass through the hallway from the west end to the east end.
The radius of the determined ball must be written using exactly eight digits after the decimal point.

Example

hallway.in	hallway.out
5 2 1 1 1	0.50000000

Problem I. Is it tele-prime?

Input file:	`isit.in`
Output file:	`isit.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

One mathematician likes to play with prime numbers. Everytime when someone gives him telephone number, he checks whether it is prime or not. He already remembers for each of his friends, whether their numbers are prime or not. But now a new system of numbers was introduced in Almaty: "Kazakhtelecom" added one digit before each phone number. It caused some problems to our mathematician because some of his friends who had prime numbers now have usual number. Fortunately, some of his friends still have prime numbers. And he calls such numbers $tele-prime$. Now mathematician wants to know if some telephone number is $tele-prime$ or not. Write a program that will help him.

Input

Input file contains a 6-digit telephone number and one digit that was added.

Output

Output file should contain Yes if the number is $tele-prime$, and No otherwise.

Example

isit.in	isit.out
946859 2	Yes

Problem J. Joke

Input file:	`joke.in`
Output file:	`joke.out`
Time limit:	2 seconds
Memory limit:	64 megabytes

A *joke* is a short story or ironic depiction of a situation communicated with the intent of being humorous. These jokes will normally have a punch line that will end the sentence to make it humorous. A joke can also be a single phrase or statement that employs sarcasm. The word joke can also be used as a slang term for a person or thing which is not taken seriously by others in general or is known as being a failure. A practical joke or prank differs from a spoken one in that the major component of the humour is physical rather than verbal (for example placing salt in the sugar bowl).

Jokes are typically for the entertainment of friends and onlookers. The desired response is generally laughter; when this does not happen the joke is said to have "fallen flat".

Jokes have been a part of human culture since at least 1900 BCE. A fart joke from ancient Sumer is currently believed to be the world's oldest known joke

Jokes can be employed by workers as a way to identify with their jobs. For example, 911 call-takers often crack jokes about incongruous, threatening, or tragic situations they deal with on a daily basis. This use of humor and cracking jokes helps employees differentiate themselves from the people they serve while also assisting them in identifying with their jobs. In addition to employees, managers use joking, or jocularity, in strategic ways. Some managers attempt to suppress joking and humor use because they feel it relates to lower production, while others have attempted to manufacture joking through pranks, pajama or dress down days, and specific committees that are designed to increase fun in the workplace.

In this problem you have to count how many times the word "joke" (all letters are in lower-case) is contained in the input file as substring.

Input

Input file may contain any text. File size will not exceed 20Kb.

Output

Output only one number – answer to a problem.

Example

joke.in	joke.out
In this joke problem all you have to do is to find how many times word "joke" can be found in the input file as substring Input file can contain any number of lines. And you have to find word "joke" in all text. But if one line contains beginning of word and the other line contains ending of word -- you don't have to count it For example, jo ke is not counted. But joke is counted	4

Problem K. KBTU party

Input file:	kbtu.in
Output file:	kbtu.out
Time limit:	2 seconds
Memory limit:	64 megabytes

At the latest KBTU "Commencement" party Bakhytzhan noticed that there were n girls $D_1, D_2, \cdots, D_n$ and $2n-1$ boys $B_1, B_2, \cdots, B_{2n-1}$. And every girl D_j knows exactly boys $B_1, B_2, \cdots, B_{2j-1}$. Throughout the evening party Bakhytzhan tried to count the number of possible choices of exactly r acquainted boys and girls pairs for dancing. That's why he missed his chance for dancing. Please, write a program that would help Bakhytzhan don't miss a chance to dance at the next party.

Input

The input file contains two integer numbers n and r ($1 \le n, r \le 10^6$) separated by a space.

Output

Output file should contain answer to Bakhytzhan's problem – residue modulo 2946859

Example

kbtu.in	kbtu.out
3 2	18