Task 1:
The series expansion of e^x is given by:

$$1 + x + x^2/2! + x^3/3! + x^4/4! + \ldots\ldots$$

Evaluate e^x for given values of x by using the above expansion for the first 10 terms.

Input

The first line contains an integer N, the number of test cases. N lines follow. Each line contains a value of x for which you need to output the value of e^x using the above series expansion. These input values have exactly 6 decimal places each.

Output

Output N lines, each containing the value of e^x, computed by your program.

Constraints

$1 \leq N \leq 50$

$-20.00 \leq x \leq 20.00$

Sample Input 1	**Sample Output 1**
4 20.0000 5.0000 0.5000 -0.5000	2423600.1887 143.6895 1.6487 0.6065

Task 2:

You will be given a $n \times n$ integer array. For each index (i, j), you will have to find the average of its top, down, left and right neighbors and put that new value at index (i, j).

Input

Input will be 2 lines. The first line will be the dimension of the array *n.* The next *n* lines will contain the values of each row of the array.

Output

The output will be the new array.

Sample Input 1	**Sample Output 1**
3 1 2 3 4 5 6 7 8 9	3 3 4 4 5 5 6 7 7

Task 3:

Given an integer$N$, and Mother integers $a_1, a_2, a_3, \ldots\ldots a_M$, find whether N is divisible by all the M integers or not.

Input

First line of input contains two integers$N$and$M$. Next there are Mintegers$a_1, a_2, a_3, \ldots\ldots a_M$.

Output

Print “YES” or “NO” without quote as an answer to the question.

Sample Input 1	Sample Output 1
100 2 3 4	NO
Sample Input 2	**Sample Output 2**
50 5 2 10	YES

Task 4:

One day Vasya painted a Cartesian coordinate system on a piece of paper and marked a set of points (x_1, y_1), (x_2, y_2), ..., (x_n, y_n). Let's define neighbors for some fixed point from the given set (x, y):

- point (x', y') is (x, y)'s right neighbor, if $x' > x$ and $y' = y$
- point (x', y') is (x, y)'s left neighbor, if $x' < x$ and $y' = y$
- point (x', y') is (x, y)'s lower neighbor, if $x' = x$ and $y' < y$
- point (x', y') is (x, y)'s upper neighbor, if $x' = x$ and $y' > y$

We'll consider point (x, y) supercentral if it has at least one upper, at least one lower, at least one left and at least one right neighbor among this set's points.

Vasya marked quite many points on the paper. Analyzing the picture manually is rather a challenge, so Vasya asked you to help him. Your task is to find the number of supercentral points in the given set.

Input

The first input line contains the only integer n, the number of points in the given set. Next n lines contain the coordinates of the points written as "x y" (without the quotes), all coordinates are integers. The numbers in the line are separated by exactly one space. It is guaranteed that all points are different.

Output

Print only the number of supercentral points of the given set.

Constraints

$1 \le n \le 200$

$|x|, |y| \le 1000$

Sample Input 1	Sample Output 1
8 1 1 4 2 3 1 1 2 0 2 0 1 1 0 1 3	2

Sample Input 2	Sample Output 2
5 0 0 0 1 1 0 0 -1 -1 0	1

Task 5:

Is Friday the 13th really an unusual event?

That is, does the 13th of the month land on a Friday less often than on any other day of the week? To answer this question, write a program that will compute the frequency that the 13th of each month lands on Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday over a given period of N years. The time period to test will be from January 1, 1900 to December 31, 1900+N-1 for a given number of years, N. N is positive and will not exceed 400.

Note that the start year is NINETEEN HUNDRED, not 1990.

There are few facts you need to know before you can solve this problem:

- January 1, 1900 was on a Monday.
- Thirty days has September, April, June, and November, all the rest have 31 except for February which has 28 except in leap years when it has 29.
- Every year evenly divisible by 4 is a leap year (1992 = 4*498 so 1992 will be a leap year, but the year 1990 is not a leap year)
- The rule above does not hold for century years. Century years divisible by 400 are leap years, all other are not. Thus, the century years 1700, 1800, 1900 and 2100 are not leap years, but 2000 is a leap year.

Input

One line with the integer N.

Output

Seven space separated integers on one line. These integers represent the number of times the 13th falls on Saturday, Sunday, Monday, Tuesday, ..., Friday.

Sample Input 1	Sample Output 1
20	36 33 34 33 35 35 34