



上海大学
SHANGHAI UNIVERSITY

2020
regionals



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2020 ICPC

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热身赛试题册

Problem A. Game

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 1024 megabytes

Wowo is playing an interesting game. Initially, there are n numbers $1, \dots, n$.

For each round, if there is at most one number left, the game ends. If there are at least two numbers left, Wowo will choose two different numbers x, y from them. Every pair of different numbers x, y are chosen with equal probability. The choice of x and y is independent of the choices of the previous rounds. If x and y are coprime, Wowo will get 1 point. Then, x, y will be deleted and the game continues to the next round.

Please calculate how many points Wowo can get from this game in expectation.

Input

The only line contains one integer n ($1 \leq n \leq 5000$).

Output

Output one number $\frac{p}{q}$ – the expectation of the points Wowo can get from the game. p, q should be coprime.

Examples

standard input	standard output
2	1/1
4	5/3

Problem B. Strawberry

Input file: standard input
Output file: standard output
Time limit: 2 seconds
Memory limit: 1024 megabytes

Farmer Wowo is going to collect strawberries. The farm contains n rows and m columns. The intersection of the i -th row and the j -th column is denoted as cell (i, j) . Initially, there is no strawberry on the farm. Beginning on the morning of the first day, a new strawberry grows from each cell every morning.

Wowo's home is at (x, y) . Every afternoon, Wowo can move to one of the adjacent grids (left, right, up, or down) or stay where he is. Every evening, Wowo collects all strawberries in his current cell. After the collection, the number of strawberries in that cell becomes 0. The last collection will be in the k -th day's evening.

The question is what the maximum number of strawberries Wowo can collect is. Please output the answer mod 998244353.

Input

The first line contains one integer t ($1 \leq t \leq 100000$) – the number of test cases.

Each test case contains 5 integers n, m, x, y, k ($1 \leq n, m \leq 10^9$, $1 \leq x \leq n$, $1 \leq y \leq m$, $1 \leq k \leq 10^{18}$).

Output

For each test case, output one integer – the maximum number of strawberries Wowo can collect. Please output the answer mod 998244353.

Example

standard input	standard output
5	1
2 2 1 1 1	3
2 2 1 1 2	6
2 2 1 1 3	10
2 2 1 1 4	14
2 2 1 1 5	

Problem C. Circle

Input file: standard input
Output file: standard output
Time limit: 1 second
Memory limit: 1024 megabytes

There are n points on a circle whose radius is 1. Wowo wants to move the points so that they are equally distanced on the circle. (We say the n points are equally distanced when no two points coincide and the convex hull of the n points forms a regular polygon.) The points can only be moved on the circle. Please calculate the minimum total distance to move.

Input

The first line contains one integer n ($1 \leq n \leq 100000$).

The second line contains n numbers, the i -th number a_i ($0 \leq a_i < 360$) represents the initial position of the i -th point. a_i is the angular coordinate of the i -th point in degrees. All numbers have at most 5 digits after the decimal point.

Output

Output one number – the minimum total distance to move.

Your answer is considered correct if its absolute or relative error does not exceed 10^{-8} .

Examples

standard input	standard output
2 0.00000 0.00000	3.1415926536
3 0.00000 120.00000 240.00000	0.0000000000