Set 1

1.

Reverse Diagonal elements of matrix

Given a square matrix of order n*n, we have to reverse the elements of both diagonals.

Examples:

Input : {1, 2, 3,

4, 5, 6,

7, 8, 9}

Output :{9, 2, 7,

4, 5, 6,

3, 8, 1}

Explanation:

Major Diagonal Elements before: 1 5 9

After reverse: 9 5 1

Minor Diagonal Elements before: 3 5 7

After reverse: 7 5 3

Input :{1, 2, 3, 4,

5, 6, 7, 8,

9, 10, 11, 12,

13, 14, 15, 16}

Output :{16, 2, 3, 13,

5, 11, 10, 8,

9, 7, 6, 12,

4, 14, 15, 1}

2.

Biswa is a genius. He likes to play with functions. He has defined a function f:

f(1, c) = c

f(N, c) = Σ f(d, c) where 1 ≤ d < N and d divides N

He has asked his younger brother Debu to find the value of function for given N and c. You task is to help Debu solve this problem.

Given N and C as 10 and 1000000000

The output would be 999999986

f(10, 109) = f(1, 109) + f(2, 109) + f(5, 109) = 3 * 109

Set 2

Given an N * N matrix, the task is to find the product of the elements of left and right diagonal.

Examples:

Input: arr[] = 1 2 3 4

5 6 7 8

9 7 4 2

2 2 2 1

Output: 9408

Explanation:

Product of left diagonal = 1 * 4 * 6 * 1 = 24

Product of right diagonal = 4 * 7 * 7 * 2 = 392

Total product = 24 * 392 = 9408

Input: arr[] = 2 1 2 1 2

1 2 1 2 1

2 1 2 1 2

1 2 1 2 1

2 1 2 1 2

Output : 512

Explanation:

Product of left diagonal = 2 * 2 * 2 * 2 * 2 = 32

Product of right diagonal = 2 * 2 * 2 * 2 * 2 = 32

But we have a common element in this case so

Total product = (32 * 32)/2 = 512

2.

Chef has just been introduced to functions and he has been experimenting a lot with the different kinds of functions. In the process, the chef has come up with an interesting problem for you.

Chef defines a function root(i, x) which gives the greatest integer less than or equal to the i th root of a positive integer x . For example, root(2, 4) is 2 and root(2, 2) is 1 .

Now the chef defines another function val(x, A, N) as follows :

val(x, A, N) = root(1, x)*A[1] + root(2, x)*A[2] + ... + root(N, x)*A[N]

where A is an array of integers of size N (indexed from 1 onwards) and x is a positive integer.

You are given the array A and its size N . You need to find out the value of val(x, A, N) for several values of x . Since this number can be very large, print the result modulo 109 + 7 .

Given Array[3] as : [4 5 6] where N=3

Explanation

Query 1 for X = 8

(root(1,8)*4 + root(2,8)*5 + root(3,8)*6) % 1000000007 = (8*4 + 2*5 + 2*6) % 1000000007 = 54 % 1000000007 = 54

Query 2 for X =30

(root(1,30)*4 + root(2,30)*5 + root(3,30)*6) % 1000000007 = (30*4 + 5*5 + 3*6) % 1000000007 = 163 % 1000000007 = 163