

Contest Duration: 2025-06-21(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250621T2100&p1=248>) - 2025-06-21(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250621T2240&p1=248>) (local time) (100 minutes)

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## E - E [max]

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Time Limit: 3 sec / Memory Limit: 1024 MiB

Score : 450 points

### Problem Statement

There are  $N$  six-sided dice. The dice are numbered from 1 to  $N$ , and the numbers written on the faces of die  $i$  are  $A_{i,1}, A_{i,2}, \dots, A_{i,6}$ .

Now, all  $N$  dice will be rolled simultaneously. Find the expected value, modulo 998244353, of the maximum value among the numbers written on the face that comes up on each die.

For any die, the face that comes up when the die is rolled is chosen independently and uniformly at random.

► Finding the expected value modulo 998244353

### Constraints

- $1 \leq N \leq 10^5$
- $1 \leq A_{i,j} \leq 10^9$
- All input values are integers.

### Input

The input is given from Standard Input in the following format:

2026-01-02 (Fri)  
05:25:54 +11:00

$N$

$$\begin{matrix} A_{1,1} & A_{1,2} & \dots & A_{1,6} \\ A_{2,1} & A_{2,2} & \dots & A_{2,6} \\ \vdots & & & \\ A_{N,1} & A_{N,2} & \dots & A_{N,6} \end{matrix}$$

## Output

Output the answer.

### Sample Input 1

[Copy](#)

2  
1 1 4 4 4 4  
1 1 1 3 3 3

[Copy](#)

### Sample Output 1

[Copy](#)

332748121

[Copy](#)

Let  $x_i$  be the number written on the face that comes up on die  $i$ .

- Case  $x_1 = 1, x_2 = 1$ : Occurs with probability  $\frac{2}{6} \times \frac{3}{6} = \frac{1}{6}$ , and the maximum value among the numbers written on the faces that come up is 1.
- Case  $x_1 = 1, x_2 = 3$ : Occurs with probability  $\frac{2}{6} \times \frac{3}{6} = \frac{1}{6}$ , and the maximum value among the numbers written on the faces that come up is 3.
- Case  $x_1 = 4, x_2 = 1$ : Occurs with probability  $\frac{4}{6} \times \frac{3}{6} = \frac{1}{3}$ , and the maximum value among the numbers written on the faces that come up is 4.
- Case  $x_1 = 4, x_2 = 3$ : Occurs with probability  $\frac{4}{6} \times \frac{3}{6} = \frac{1}{3}$ , and the maximum value among the numbers written on the faces that come up is 4.

Thus, the expected value to be found is  $\frac{1}{6} \times 1 + \frac{1}{6} \times 3 + \frac{1}{3} \times 4 + \frac{1}{3} \times 4 = \frac{10}{3} \equiv 332748121 \pmod{998244353}$ .

### Sample Input 2

[Copy](#)

2  
1 1 1 1 1 1  
2 2 2 2 2 2

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## Sample Output 2

Copy

2

Copy

The numbers written on the faces that come up on dice 1, 2 are always 1, 2, respectively, and their maximum value is always 2.

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## Sample Input 3

Copy

```
8
55 76 80 21 34 28
82 84 2 32 56 17
11 57 37 28 39 18
47 2 97 25 75 29
72 45 22 75 26 81
6 79 16 68 68 40
31 80 68 57 18 55
49 10 63 91 93 40
```

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## Sample Output 3

Copy

213725517

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#telegram)

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