

Matrix Determinant

FatalEagle recently stumbled upon a manga that teaches linear algebra. A particularly interesting topic was [matrix determinants](#). Your task is simple: given A , an $N \times N$ matrix, find its determinant! Since this number can be really big, we want to find its value mod 1 000 000 007 ($10^9 + 7$).

Input Specification

The first line of input will have N .

The next N lines will have N integers each. The j^{th} integer of the i^{th} line will contain $A_{i,j}$ ($-10^9 \leq A_{i,j} \leq 10^9$).

For cases worth 30% of the total marks, $1 \leq N \leq 8$.

For cases worth another 30% of the total marks, $1 \leq N \leq 20$.

For all test cases, $1 \leq N \leq 500$.

Output Specification

The output should be a single integer in the range $[0, 1\,000\,000\,007)$, the determinant of the matrix A .

Sample Input 1

```
2
-1 3
-5 7
```

Sample Output 1

```
8
```

Sample Input 2

```
6
1 3 5 2 4 6
2 5 4 3 1 6
6 1 2 3 4 5
2 5 1 3 6 4
4 5 1 2 3 6
5 4 3 6 1 2
```

Sample Output 2

```
2457
```