Currencies

by pkacprzak

Problem Submissions Leaderboard Discussions

In this challenge, you are doing currency exchange operations, and your goal is to maximize the final amount of money in the final currency. There are n currencies in total, and they are numbered from 0 to $n-1$. The exchange rates are provided in a square matrix a with n rows and n columns, where $a_{i,j}$ denotes the exchange rate of the i^{th} currency to the j^{th} currency. You are given an initial amount of money x, the starting currency s, the final currency f, and the number of operations m. Your task is to find the maximum amount of money in currency f that you can get by performing exactly m exchanges starting with x amount of money in currency s. Since the final result can be huge, print its value modulo $10^9 + 7$.

Note: Remember that an exchange operation changes the currency of your assets, which means that you cannot exchange money in the current currency to itself.

For example, the currency matrix is given as follows:

	0	1	2
0	0	1	3
1	4	0	4
2	4	5	0

For $x = 1, s = 0 \text{ and } f = 2$. If we have $m = 2$, maximum value attained is 4 when we convert $0 \to 1$ and $1 \to 2$.

For $m = 3$, maximum value attained is 60 when we convert $0 \to 2$, $2 \to 1$ and then $1 \to 2$.

Input Format

The first line contains an integer n.
The second line contains 4 space-separated integers x, s, f, m.
Then, n lines follow. The i^{th} line denotes the i^{th} row of matrix a and contains n space-separated integer numbers $a_{i,0}, a_{i,1}, \cdots, a_{i,n-1}$.

Constraints

- $3 \le n \le 20$
- $1 \le x \le 10^3$
- $0 \le s, f \le n-1$
- $2 \le m \le 10^9$
- $1 \le a_{i,j} \le 10 \, \forall i \neq j$
- $a_{i,i} = 0$

Output Format

In a single line, print a single number denoting the maximum amount of money you can obtain modulo $10^9 + 7$.

Sample Input 0

```
3
5 0 2 2
0 5 7
1 0 10
3 2 0
```

Sample Output 0

```
250
```

Explanation 0

The two transactions will be as follows:

1. The amount of 5 in currency 0 is converted to $5X5 = 25$ amount of money in currency 1.
2. Then, the amount of 25 amount in currency 1 is converted to $10X25 = 250$ amount of money in currency 2. So, the final amount of money in currency 2 is 250.

Contest ends in 9 hours

Submissions: 1129
Max Score: 60
Difficulty: Hard

Rate This Challenge:
☆☆☆☆☆

More

Current Buffer (saved locally, editable)

C++

```
#include <bits/stdc++.h>

using namespace std;

double currencies(int n, int x, int s, int f, int m, vector < vector<double> > A) {
    // Complete this function
}

int main() {
    int n;
    cin >> n;
    int x;
    int s;
    int f;
    int m;
    cin >> x >> s >> f >> m;
    vector< vector<double> > A(n,vector<double>(n));
    for(int A_i = 0;A_i < n;A_i++){
       for(int A_j = 0;A_j < n;A_j++){
          cin >> A[A_i][A_j];
       }
    }
    return 0;
}
```

Line: 1 Col: 1

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