YTP Problem 3：納許均衡 - 解答 / Nash Equilibria - Solution

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解答

由題目的敘述可以知道，一個選項的組合 (i, j)（E 選 i 而 C 選 j）為好的若且唯若：

1. 對於所有的 $i' \in [1, N]$，$X_{ij} \geq X_{i'j}$

2. 對於所有的 $j' \in [1, M]$，$Y_{ij} \geq Y_{ij'}$

對於兩個條件分別去計算是否符合，再數符合條件者即可，總複雜度 $O(NM)$。

Solution

From the problem statement, we know that a combination of choices (i, j) (made by E and C, respectively) is to be counted if and only if:

1. for all $i' \in [1, N]$, $X_{ij} \geq X_{i'j}$

2. for all $j' \in [1, M]$, $Y_{ij} \geq Y_{ij'}$

and thus all that needs to be done is just to separately check if the statements are satisfied, and then count the ones which satisfy both constraints. This can be done in $O(NM)$ time.

官解 / AC Code

```cpp
#include <iostream>
using namespace std;
#define ericxiao ios_base::sync_with_stdio(0);cin.tie(0);
#define max(a,b) (a)>(b)?a:b
const int maxN = 1e3 + 326;



int N, M, X[maxN][maxN], Y[maxN][maxN], cnt[maxN][maxN], ans = 0, mx;

int main() {
    ericxiao;

    cin >> N >> M;
    for(int i = 0; i < N; i++) for(int j = 0; j < M; j++) cin >> X[i]
    ↪ [j] >> Y[i][j];

        for(int j = 0; j < M; j++){
            mx = -2e9;
            for(int i = 0; i < N; i++) mx = max(mx, X[i][j]);
            for(int i = 0; i < N; i++) if(X[i][j] == mx) cnt[i][j]++;
        }

        for(int i = 0; i < N; i++){
            mx = -2e9;
            for(int j = 0; j < M; j++) mx = max(mx, Y[i][j]);
            for(int j = 0; j < M; j++) if(Y[i][j] == mx) cnt[i][j]++;
        }

    for(int i = 0; i < N; i++) for(int j = 0; j < M; j++) if(cnt[i][j]
    ↪  == 2) ans++;
        cout << ans << endl;
}
```