LAB REPORT 实验报告

Lab Title	2-D Arrays				Lab No.	07
Stud. Name		Major		CST	Class	
Student ID			Date			

Lab description/objectives:

Write a function *void mincol(int a[N][N], int b[N])* to find the smallest element in each column of the array *a[][]* of size NxN, and store it in array *b[]* of size N.

Source code:

```c
#include <stdio.h>
#include <stdlib.h>
int n;
void mincol(int** a, int* b) {
    for (int i = 0; i < n; i++) {
        b[i] = a[0][i];
        for (int j = 1; j < n; j++) {
            if (a[j][i] < b[i]) {
                b[i] = a[j][i];
            }
        }
    }
    return;
}
int main() {
    printf("Input a number n to create a 2-D n x n array.\n");
    scanf("%d", &n);
    int** a = (int**)malloc(sizeof(int*) * n);
    int* b = (int*)calloc(n, sizeof(int));
    printf("Input the elements of this n x n array.\n");
    for (int i = 0; i < n; i++) {
        a[i] = (int*)calloc(n, sizeof(int));
        for (int j = 0; j < n; j++) {
            scanf("%d", &a[i][j]);
        }
    }
    mincol(a, b);
    for (int i = 0; i < n; i++) {
```

```
        printf("The minimum number of column %d is %d.\n", i, b[i]);
    }
    return 0;

}
```

Program outputs:

Microsoft Visual Studio 调试控制台

```
Input a number n to create a 2D n x n array.
3
Input the elements of this n x n array.
1 2 3
4 5 6
7 8 9
The minimum number of column 0 is 1.
The minimum number of column 1 is 2.
The minimum number of column 2 is 3.
```

Microsoft Visual Studio 调试控制台

```
Input a number n to create a 2D n x n array.
5
Input the elements of this n x n array.
3 4 533 53 1
0 2 -11 23 32
12 3 4 -100 3
-2 5 32 55 44
133 44 31 -9 0
The minimum number of column 0 is -2.
The minimum number of column 1 is 2.
The minimum number of column 2 is -11.
The minimum number of column 3 is -100.
The minimum number of column 4 is 0.
```

Microsoft Visual Studio 调试控制台

```
Input a number n to create a 2D n x n array.
2
Input the elements of this n x n array.
1 0
0 -1
The minimum number of column 0 is 0.
The minimum number of column 1 is -1.
```

Discussion:

1. **Most difficult parts**

   The 2-D array name "int arr[][]" can't be the parameter for function directly. Using "int** arr" can solve this problem.

2. **Bugs and/or Errors**