

LAB REPORT 实验报告

Lab Title	Functions			Lab No.	05
Stud. Name		Major	CST	Class	
Student ID			Date		

Lab description/objectives:
Write and test two functions, named det2() and det3(). The det2() function should accept the four coefficients of a 2-by-2 matrix and return its determinant. The det3() function should accept the nine coefficients of a 3-by-3 matrix and return its determinant by calling det2() to calculate the required 2-by-2 determinants.

Source code:

```
#include <stdio.h>
#include <stdlib.h>

double det2(double**, int, int, int, int);
double det3(double**);

int main()
{
    int level = 0;

    double result = 0;

    printf("please type in the level of determinant(2 / 3)\n");
    scanf("%d", &level);

    if (level == 2) {
        double** det = (double**)malloc(sizeof(double*) * level);

        for (int i = 0; i < level; i++) {
            det[i] = (double*)malloc(sizeof(double) * level);

            for (int j = 0; j < 2; j++) {
                scanf("%lf", &det[i][j]);
            }
        }

        result = det2(det, 0, 1, 0, 1);

        printf("%lf\n", result);
    }
}
```

```
}  
  
else if (level == 3) {  
    double** det = (double**)malloc(sizeof(double*) * level);  
    for (int i = 0; i < level; i++) {  
        det[i] = (double*)malloc(sizeof(double) * level);  
        for (int j = 0; j < 3; j++) {  
            scanf("%lf", &det[i][j]);  
        }  
    }  
    result = det3(det);  
    printf("%lf\n", result);  
}  
else {  
    printf("Wrong input, the program will end.\n");  
}  
return 0;  
}  
  
double det2(double** det, int row1, int row2, int col1, int col2)  
{  
    double result = det[row1][col1] * det[row2][col2] - det[row1][col2] * det[row2][col1];  
    return result;  
}  
  
double det3(double** det)  
{  
    double result = 0;  
    result += det[0][0] * det2(det, 1, 2, 1, 2);  
    result -= det[1][0] * det2(det, 0, 2, 1, 2);  
    result += det[2][0] * det2(det, 0, 1, 1, 2);  
    return result;  
}
```

Program outputs:

```
h3art — 80x24
Launching: '/Users/h3art/Projects/homework/LAB05'
Working directory: '/Users/h3art/Projects/homework'
1 arguments:
argv[0] = '/Users/h3art/Projects/homework/LAB05'
please type in the level of determinant(2 / 3)
2
2 0
0 3
6.000000
Process exited with status 0
logout
Saving session...
...copying shared history...
...saving history...truncating history files...
...completed.

[进程已完成]
```

```
h3art — 80x24
Launching: '/Users/h3art/Projects/homework/LAB05'
Working directory: '/Users/h3art/Projects/homework'
1 arguments:
argv[0] = '/Users/h3art/Projects/homework/LAB05'
please type in the level of determinant(2 / 3)
3
1 1 0
0 2 2
3 4 5
8.000000
Process exited with status 0
logout
Saving session...
...copying shared history...
...saving history...truncating history files...
...completed.

[进程已完成]
```

Discussion:

1. Most difficult parts

Learning how to use array.

2. Bugs and/or Errors

When the array become the parameter of a function, it will be transform into a pointer.