第九次作业

第一题

```c
//选择排序
#include <stdio.h>
#include <stdlib.h>
#define N 300
int main() {
    int a[N],pos ;
    for (int i = 0;i < N;i++) {
        a[i]= 50 + rand() % 101;
    }
    for (int i = 0;i < N;i++) {
        int max = a[i];
        for (int j = i;j < N;j++) {
            if (a[j] >= max) {
                max = a[j];
                pos = j;
            }
        }
        int temp = a[i];
        a[i] = a[pos];
        a[pos] = temp;
    }
    for (int i = 0;i < 100;i++) {
        printf("%d\n", a[i]);
    }

    return 0;
}
//快排
#include <stdio.h>
#include <stdlib.h>
#define N 300
void sort(int a[],int l,int r);
void sort(int a[],int l,int r)
```

```
{
    if (l < r) {
        int i, j, x;

        i = l;
        j = r;
        x = a[i];
        while (i < j)
        {
            while (i < j && a[j] > x)
                j--;
            if (i < j)
                a[i++] = a[j];
            while (i < j && a[i] < x)
                i++;
            if (i < j)
                a[j--] = a[i];
        }
        a[i] = x;
        sort(a, l, i - 1);
        sort(a, i + 1, r);
    }
}
int main() {
    int a[N];
    for (int i = 0;i < N;i++) {
        a[i] = 50 + rand() % 101;
    }
    sort(a, 0, N - 1);
    for (int i = N-1;i >=200;i--) {
        printf("%d\n", a[i]);
    }
    return 0;
}
```

```
150
150
150
150
149
149
149
149
148
148
148
148
147
147
147
147
146
146
146
145
145
145
144
144
144
144
143
143
```

[2]	150	int
[3]	150	int
[4]	149	int
[5]	149	int
[6]	149	int
[7]	149	int
[8]	148	int
[9]	148	int
[10]	148	int
[11]	148	int
[12]	147	int
[13]	147	int
[14]	147	int
[15]	147	int
[16]	146	int
[17]	146	int
[18]	146	int
[19]	145	int
[20]	145	int
[21]	145	int

第二题

```c
#include <stdio.h>
#include <math.h>
void swap_row(int row1, int row2);
double a[4][4] = { {1.1161,0.1254,0.1397,0.1490},
{0.1582,1.1675,0.1768,0.1871},{0.2368,0.2471,0.2568,1.2671},
{0.1968,0.2071,1.2168,0.2271} };
double b[4] = { 1.5471,1.6471,1.8471,1.7471 };
double x[4];
void swap_row(int row1, int row2)
{//交换行列
    double temp;
    for (int j=0;j <=3;j++) {
        temp = a[row1][j];
        a[row1][j] = a[row2][j];
        a[row2][j] = temp;
    }
    temp = b[row1];
    b[row1] = b[row2];
    b[row2] = temp;
}
int main() {
    printf("MAT A = \n");
    for (int i = 0;i <= 3;i++) {
        printf("    ");
        for (int j = 0;j <= 3;j++)printf("%.4f   ", a[i][j]);
        printf("\n");
    }
    printf("MAT B = \n");
    for (int i = 0;i <= 3;i++) {
        printf("    %.4f", b[i]);
    }
    printf("\n\n");
    for (int k = 0;k < 3;k++) {
        double max = fabs(a[k][k]);
        int pos = k;
        for (int i = k;i <= 3;i++) {
            if (fabs(a[i][k]) >= max) {
                max = fabs(a[i][k]);
                pos = i;
            }
```

```
        }
        swap_row(k,pos);
        for (int j = k+1;j <= 3;j++) {
            a[k][j] /= a[k][k];
        }
        b[k] /= a[k][k];
        for (int i = k + 1;i <= 3;i++) {
            for (int j = k + 1;j <= 3;j++) {
                a[i][j] = a[i][j] - a[i][k] * a[k][j];
            }
        }
        for (int i = k + 1;i <= 3;i++) {
            b[i] = b[i] - a[i][k] * b[k];
        }
    }
    x[3] = b[3] / a[3][3];
    for (int i = 2;i >=0;i--) {
        double sum=0;
        for (int j = i + 1;j <= 3;j++)sum += a[i][j] * x[j];
        x[i] = b[i] - sum;
    }
    for (int i = 0;i <= 3;i++) {
        printf("    x(%d) = %.4f\n", i+1 ,x[i]);
    }
    return 0;
}
```

```
MAT A =
    1.1161    0.1254    0.1397    0.1490
    0.1582    1.1675    0.1768    0.1871
    0.2368    0.2471    0.2568    1.2671
    0.1968    0.2071    1.2168    0.2271
MAT B =
    1.5471     1.6471     1.8471     1.7471

    x(1) = 1.0406
    x(2) = 0.9870
    x(3) = 0.9351
    x(4) = 0.8813
```

第三题

```c
#include <stdio.h>
int main() {
    int x, y;
    /*
    * x+y=15
    * 2x+4y=40
    * */
    for (x = 0;x <= 15;x++) {
        y = 15 - x;
        if (2 * x + 4 * y == 40)break;
    }
    printf("鸡有%d只  兔有%d只  \n", x, y);
    return 0;
}
```

```
鸡有10只  兔有5只
```