Week2.综合编程练习

2.1寻找下标

```
#include <iostream>
using namespace std;

int main() {
    int N = 0;
    cin >> N;
    int a[1000];
    for ( int i = 0; i < N; i++){
        cin >> a[i];
    }
    for ( int j = 0; j < N; j++){
        if( a[j] == j){
            cout << a[j] << endl;
            break;
        }
        if((j == N-1) && (a[j] != j)){
            cout << "N";
        }
    }
    return 0;
}
```

2.2四大湖

```
#include<iostream>
#include<stdlib.h>
using namespace std;
int main(){
    int py, dt, th, hz, sum[4] = { 0 };
    for (py = 1; py <= 4; py++){
        for (dt = 1; dt <= 4; dt++){
            if (py == dt) continue;
            for (th = 1; th <= 4; th++){
                if (th == py || th == dt) continue;
                hz = 10 - py - dt - th;
                sum[0] = (py == 3) + (dt == 1) + (hz == 4);
```

```
                sum[1] = (py == 2) + (dt == 4) + (th == 3) + (hz == 1);
                sum[2] = (dt == 3) + (hz == 4);
                sum[3] = (py == 1) + (dt == 3) + (th == 4) + (hz == 2);
                if (sum[0] == 1 && sum[1] == 1 && sum[2] == 1 && sum[3] == 1){
                    cout << py << endl;
                    cout << dt << endl;
                    cout << th << endl;
                    cout << hz << endl;
                }
            }
        }
    }
    system("pause");
    return 0;
}
```

2.3发票统计

```
#include <iostream>
#include <iomanip>
using namespace std;

int main() {
    float sum[6];
    for (int i = 0; i < 3; i++) {
        int a;
        cin >> a;
        int n;
        cin >> n;
        for (int j = 0; j < n; j++) {
            char b;
            cin >> b;
            float c;
            cin >> c;
            sum[a - 1] = sum[a - 1] + c;
            if (b == 'A') {
                sum[3] = sum[3] + c;
            } else if (b == 'B') {
                sum[4] = sum[4] + c;
            } else if (b == 'C') {
                sum[5] = sum[5] + c;
            }
        }
    }
    cout << fixed << setprecision(2);
```

```
    cout << "1 " << sum[0] << endl;
    cout << "2 " << sum[1] << endl;
    cout << "3 " << sum[2] << endl;
    cout << "A " << sum[3] << endl;
    cout << "B " << sum[4] << endl;
    cout << "C " << sum[5] << endl;
    return 0;
}
```

2.4TNK

```
#include <iostream>
#include <iomanip>
using namespace std;

int main() {
    float sum[6];
    for (int i = 0; i < 3; i++) {
        int a;
        cin >> a;
        int n;
        cin >> n;
        for (int j = 0; j < n; j++) {
            char b;
            cin >> b;
            float c;
            cin >> c;
            sum[a - 1] = sum[a - 1] + c;
            if (b == 'A') {
                sum[3] = sum[3] + c;
            } else if (b == 'B') {
                sum[4] = sum[4] + c;
            } else if (b == 'C') {
                sum[5] = sum[5] + c;
            }
        }
    }
    cout << fixed << setprecision(2);
    cout << "1 " << sum[0] << endl;
    cout << "2 " << sum[1] << endl;
    cout << "3 " << sum[2] << endl;
    cout << "A " << sum[3] << endl;
    cout << "B " << sum[4] << endl;
    cout << "C " << sum[5] << endl;
    return 0;
```

```
}
```

```
#define _CRT_SECURE_NO_WARNINGS
#include<iostream>
#include<stdlib.h>
#include<stdio.h>
using namespace std;
int main(){
    int y, m, d;
    scanf("%d-%d-%d", &y, &m, &d);
    int isleapyear = y % 400 == 0 || (y%4==0&&y%100!=0);
    switch (m){
    case 1:case 3: case 5: case 7:case 8:case 10:
        if (d== 31){
            d = 1;m++;
        }
        else{
            d++;
        }
        break;
    case 2:
        if (isleapyear){
            if (d == 29){
                d=1; m++;
            }
            else{
                d++;
            }
        }
        else{
            if (d == 28){
                d = 1; m++;
            }
            else{
                d++;
            }
        }
        break;
    case 4:case 6:case 9:case 11:
        if (d == 30){
            d = 1; m++;
        }
        else{
            d++;
        }
        break;
    case 12:
```

```
        if (d == 31){
            d = 1; m = 1; y++;
        }
        else{
            d++;
        }
        break;
    }
    printf("%d-%02d-%02d\n", y, m, d);
    system("pause");
    return 0;
}
```

2.5细菌分组

```
#include <iostream>
using namespace std;
//细菌实验分组
int n;//n为细菌数量

void ReOrder(int id[], double rate[]){
    //对整个细菌排序
    for(int i = 0; i < n; i++){
        for(int j = 0; j < n - i -1; j++){
            if(rate[j+1] > rate[j]){
                int tmpID = id[j];
                id[j] = id[j+1];
                id[j+1] = tmpID;
                double tmpRate = rate[j];
                rate[j] = rate [j+1];
                rate[j+1] = tmpRate;
            }
        }
    }
}

int main(){
    //id记录细菌的编号，rate记录细菌的繁殖率
    int id[100];
    double rate[100];

    cin >> n;

    for(int i = 0; i < n; i++){
        int initial, final;
```

```
        cin >> id[i] >> initial >> final;
        rate[i] = (double)final / initial;
    }

    ReOrder(id, rate);

    //记录最大的差
    double maxDiff = 0;
    //和最大的下标
    int maxDiffIndex = 0;
    for(int i =0; i < n-1;i++){
        double diff = rate[i] - rate[i+1];
        if(maxDiff < diff){
            maxDiff = diff;
            maxDiffIndex = i;
        }
    }

    //输出繁殖率较大的那组细菌
    cout << maxDiffIndex + 1 << endl;
    for(int i = maxDiffIndex; i >= 0; i--){
        cout << id[i] << endl;
    }

    //输出繁殖率较小的那组细菌
    cout << n- maxDiffIndex - 1 << endl;
    for(int i = n - 1; i >= maxDiffIndex + 1; i--){
        cout << id[i] << endl;
    }

    return 0;
}
```

```
#include<iostream>
#include<stdlib.h>
using namespace std;
struct Bact{
    int no; int befer; int after; double rate;
};
typedef struct Bact bact;
int panduan(bact *b, int n){
    double max = b[1].rate - b[0].rate; int index = 0;
    for (int i = 1; i < n - 2; i++){
        if (b[i+1].rate-b[i].rate>max){
            max = b[i + 1].rate - b[i].rate;
            index = i;
        }
```

```
    }
    return index;
}

int main5(){
    int n; cin >> n; int no, befer, after; double rate;
    bact *b = (bact *)malloc(sizeof(bact)* 100);
    for (int i = 0; i < n; i++){
        cin >> no; cin >> befer; cin >> after;
        rate = (double)(after - befer) / befer;
        b[i].no = no; b[i].befer = befer; b[i].after = after; b[i].rate = rate;
    }
    int temp1, temp2, temp3; double temp;
    for (int i = 0; i < n - 1; i++){
        for (int j = 0; j < n - i - 1; j++){
            if (b[j].rate>b[j + 1].rate){
                temp1 = b[j].no; b[j].no = b[j + 1].no; b[j + 1].no = temp1;
                temp2 = b[j].befer; b[j].befer = b[j + 1].befer; b[j + 1].befer = t
emp2;
                temp3 = b[j].after; b[j].after = b[j + 1].after; b[j + 1].after = t
emp3;
                temp = b[j].rate; b[j].rate = b[j + 1].rate; b[j + 1].rate = temp;
            }
        }
    }
    int t = panduan(b, n);
    cout << n - t - 1 << endl;
    for (int i = t + 1; i < n; i++){
        cout << b[i].no << endl;
    }
    cout << t + 1 << endl;
    for (int i = 0; i <= t; i++){
        cout << b[i].no << endl;
    }
    free(b);
    return 0;
}
```

2.6流感传染

```
#include <iostream>
using namespace std;
//流感传染
int main(){
    int n, m;
```

```
    cin >> n;
    char matrix[n][n];

    for(int i = 0; i < n; i++){
        for(int j = 0; j < n; j++){
            cin >> matrix[i][j];
        }
    }

    cin >> m;

    for(int k = 1; k < m; k++){
        for(int i = 0; i < n; i++){
            for(int j = 0; j < n; j++){
                if(matrix[i][j] == '@'){
                    if(i - 1 >= 0 && matrix[i - 1][j] =='.')
                        matrix[i - 1][j] = '*';
                    if(i + 1 < n && matrix[i + 1][j] == '.')
                        matrix[i + 1][j] = '*';
                    if(j - 1 >= 0 && matrix[i][j - 1] =='.')
                        matrix[i][j - 1] = '*';
                    if(j + 1 < n && matrix[i][j + 1] == '.')
                        matrix[i][j + 1] = '*';
                }
            }
        }
        for(int i = 0; i < n; i++)
            for(int j = 0; j < n; j++)
                if(matrix[i][j] == '*')
                    matrix[i][j] = '@';
    }

    int sum = 0;
    for(int i = 0; i < n; i++)
        for(int j = 0; j < n; j++)
            if(matrix[i][j] == '@')
                sum += 1;

    cout << sum << endl;
    return 0;
}
```