Problem Solving using c and c++

Lab Assignment 9

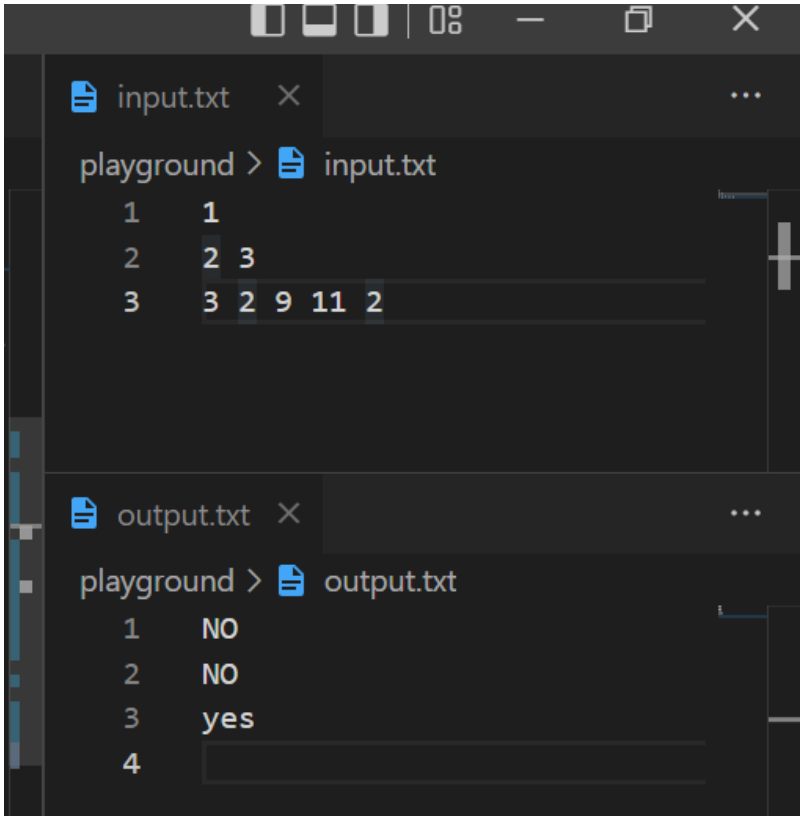
Patil Amit Gurusidhappa
19104004
B11

Q1. Monk is standing at the door of his classroom. There are currently N students in the class,ith student got a i candies. There are still M more students to come. At every instant, a student enters the class and wishes to be seated with a student who has exactly the same number of candies. For each student, Monk shouts YES if such a student is found, NO otherwise.
HINT: Use map or unordered set

```cpp
#include <bits/stdc++.h>
using namespace std;

#define debug(...) __f(#__VA_ARGS__, __VA_ARGS__)

template <typename Arg1>
void __f(const char *name, Arg1 &&arg1)
{
    cout << name << " : " << arg1 << endl;
}

template <typename Arg1, typename... Args>
void __f(const char *names, Arg1 &&arg1, Args &&...args)
{
    const char *comma = strchr(names + 1, ',');
    cout.write(names, comma - names) << " : " << arg1 << " | ";
    __f(comma + 1, args...);
}

void solve()
{
    int n, m;
    unordered_map<int, bool> map;
    cin >> n, m;
    for (int i = 0; i < n; i++)
```

```
    {
        int a;
        cin >> a;
        map[a] = true;
    }
    for (int i = 0; i < m; i++)
    {
        int a;
        cin >> a;
        if (map.count(a) > 0)
        {
            cout << "yes" << endl;
        }
        else
        {
            cout << "NO" << endl;
        }
    }
}

int main()
{
#ifndef ONLINE_JUDGE
    freopen("E:/Work/Interview Prep/DSA/playground/input.txt", "r",
stdin);
    freopen("E:/Work/Interview Prep/DSA/playground/output.txt", "w",
stdout);
#endif
    clock_t z = clock();
    int test = 1;
    cin >> test;
    while (test--)
    {
        solve();
    }
    cerr << "Run Time : " << ((double)(clock() - z) / CLOCKS_PER_SEC);
    return 0;
}
```

Output:



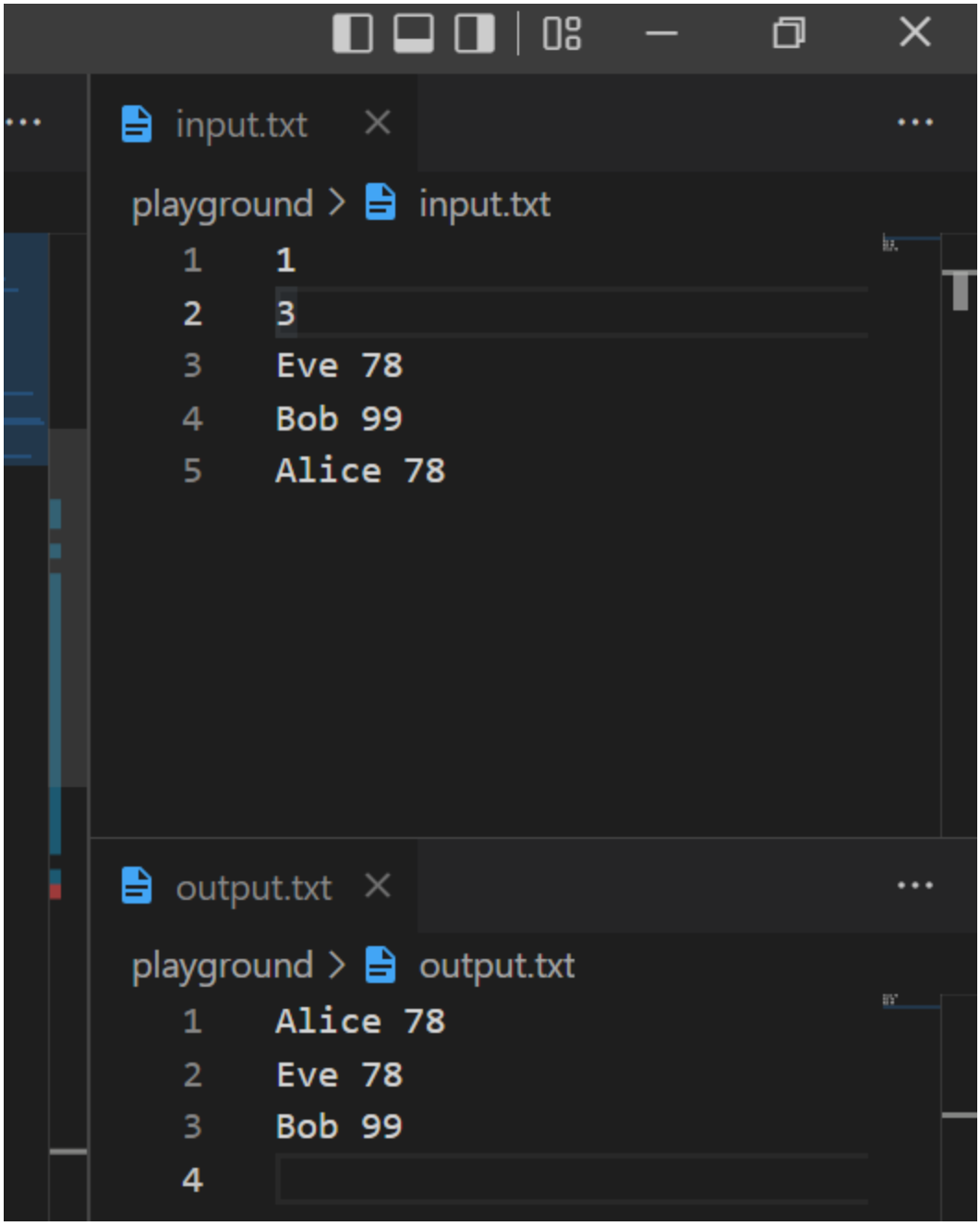
Q2. Monk is a multi-talented person, and prepares results for his college in his free time. (Yes, he is still in love with his old college!) He gets a list of students with their marks. The maximum marks which can be obtained in the exam is 100.
The Monk is supposed to arrange the list in such a manner that the list is sorted in decreasing order of marks. And if two students have the same marks, they should be arranged in lexicographical manner. Help Monk prepare the same!

```
#include <bits/stdc++.h>
using namespace std;

#define debug(...) __f(#__VA_ARGS__, __VA_ARGS__)

template <typename Arg1>
void __f(const char *name, Arg1 &&arg1)
{
    cout << name << " : " << arg1 << endl;
}

template <typename Arg1, typename... Args>
void __f(const char *names, Arg1 &&arg1, Args &&...args)
{
```

```
    const char *comma = strchr(names + 1, ',');
    cout.write(names, comma - names) << " : " << arg1 << " | ";
    __f(comma + 1, args...);
}
bool sortbysec(const pair<string, int> &a,
               const pair<string, int> &b)
{
    if (a.second == b.second)
    {
        return a.first < b.first;
    }
    return (a.second < b.second);
}

void solve()
{
    int n, mark;
    cin >> n;
    string name;
    vector<pair<string, int>> students;
    for (int i = 0; i < n; i++)
    {
        cin >> name >> mark;
        students.push_back({name, mark});
    }
    sort(students.begin(), students.end(), sortbysec);
    // sort(students.begin(), students.end());
    for (int i = 0; i < n; i++)
    {
        cout << students[i].first << " " << students[i].second << endl;
    }
}

int main()
{
#ifndef ONLINE_JUDGE
    freopen("E:/Work/Interview Prep/DSA/playground/input.txt", "r",
stdin);
    freopen("E:/Work/Interview Prep/DSA/playground/output.txt", "w",
stdout);
```

```
#endif
    clock_t z = clock();
    int test = 1;
    cin >> test;
    while (test--)
    {
        solve();
    }
    cerr << "Run Time : " << ((double)(clock() - z) / CLOCKS_PER_SEC);
    return 0;
}
```

Output


input.txt
playground > input.txt
1 1
2 3
3 Eve 78
4 Bob 99
5 Alice 78
output.txt
playground > output.txt
1 Alice 78
2 Eve 78
3 Bob 99
4