Shri Vile Parle Kelavani Mandal's

INSTITUTE OF TECHNOLOGY

DHULE (M.S.)

DEPARMENT OF COMPUTER ENGINEERING

Subject : Competitive Programming Lab

Name: Mohammed Meraj Mohammed Ashfaque **Roll No. :** 32

Class : TY. Comp. Engg. **Batch : T2** **Division: T**

Expt. No. :08 **Date : 24/03/2025**

Title : Shoemaker's Problem

Remark

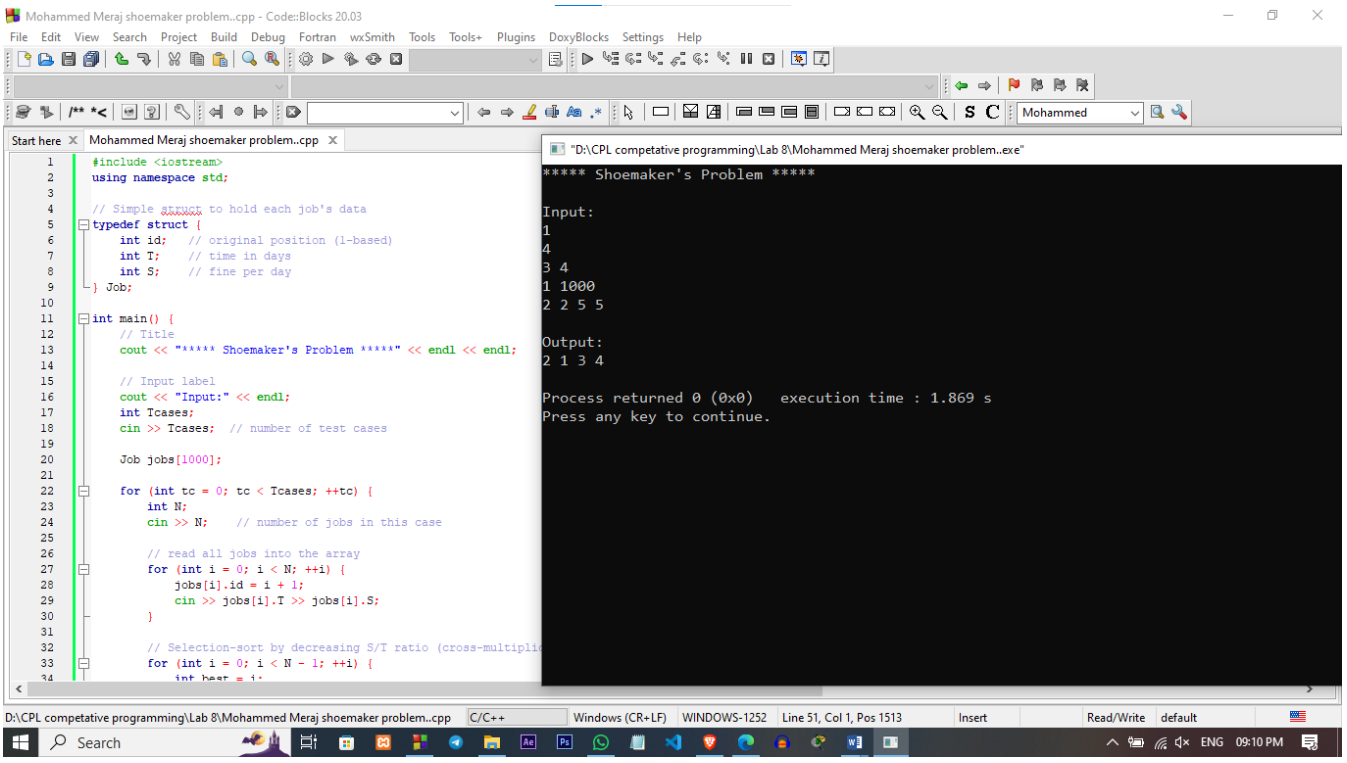
Signature

Language: C++

```
// Shoemaker's Problem by Meraj 32 T2
#include <iostream>
using namespace std;

// Simple struct to hold each job's data
typedef struct {
    int id;   // original position (1-based)
    int T;    // time in days
    int S;    // fine per day
} Job;

int main() {
    // Title
    cout << "***** Shoemaker's Problem *****" << endl << endl;

    // Input label
    cout << "Input:" << endl;
    int Tcases;
    cin >> Tcases;  // number of test cases

    Job jobs[1000];

    for (int tc = 0; tc < Tcases; ++tc) {
```

```
        int N;
        cin >> N;    // number of jobs in this case

        // read all jobs into the array
        for (int i = 0; i < N; ++i) {
            jobs[i].id = i + 1;
            cin >> jobs[i].T >> jobs[i].S;
        }

        // Selection-sort by decreasing S/T ratio (cross-multiplication) with tie-break on id
        for (int i = 0; i < N - 1; ++i) {
            int best = i;
            for (int j = i + 1; j < N; ++j) {
                long left  = (long)jobs[j].S * jobs[best].T;
                long right = (long)jobs[best].S * jobs[j].T;
                if (left > right || (left == right && jobs[j].id < jobs[best].id)) {
                    best = j;
                }
            }
            if (best != i) {
                Job temp = jobs[i];
                jobs[i] = jobs[best];
                jobs[best] = temp;
            }
        }

        // Output label (once before first case's results)
        if (tc == 0) cout << endl << "Output:" << endl;

        // print the sorted sequence of job IDs
        for (int i = 0; i < N; ++i) {
            cout << jobs[i].id;
            if (i < N - 1) cout << " ";
        }
        cout << endl;
    }

    return 0;
}
```

Output :


Mohammed Meraj shoemaker problem..cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here
Mohammed Meraj shoemaker problem..cpp
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int main() {
// Title
cout << "***** Shoemaker's Problem *****" << endl << endl;
// Input label
cout << "Input:" << endl;
int Tcases;
cin >> Tcases; // number of test cases
Job jobs[1000];
for (int tc = 0; tc < Tcases; ++tc) {
int N;
cin >> N; // number of jobs in this case
// read all jobs into the array
for (int i = 0; i < N; ++i) {
jobs[i].id = i + 1;
cin >> jobs[i].T >> jobs[i].S;
}
// Selection-sort by decreasing S/T ratio (cross-multipli
for (int i = 0; i < N - 1; ++i) {
"D:\CPL competative programming\Lab 8\Mohammed Meraj shoemaker problem..exe"
***** Shoemaker's Problem *****
Input:
1
4
3 4
1 1000
2 2 5 5
Output:
2 1 3 4
Process returned 0 (0x0) execution time : 1.869 s
Press any key to continue.
D:\CPL competative programming\Lab 8\Mohammed Meraj shoemaker problem..cpp
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 51, Col 1, Pos 1513
Insert
Read/Write
default
Search
ENG
09:10 PM