



Shri Vile Parle Kelavani Mandal's  
**INSTITUTE OF TECHNOLOGY**  
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**DEPARTMENT OF COMPUTER ENGINEERING**

**Subject : Competitive Programming Lab**

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**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;
    }
}

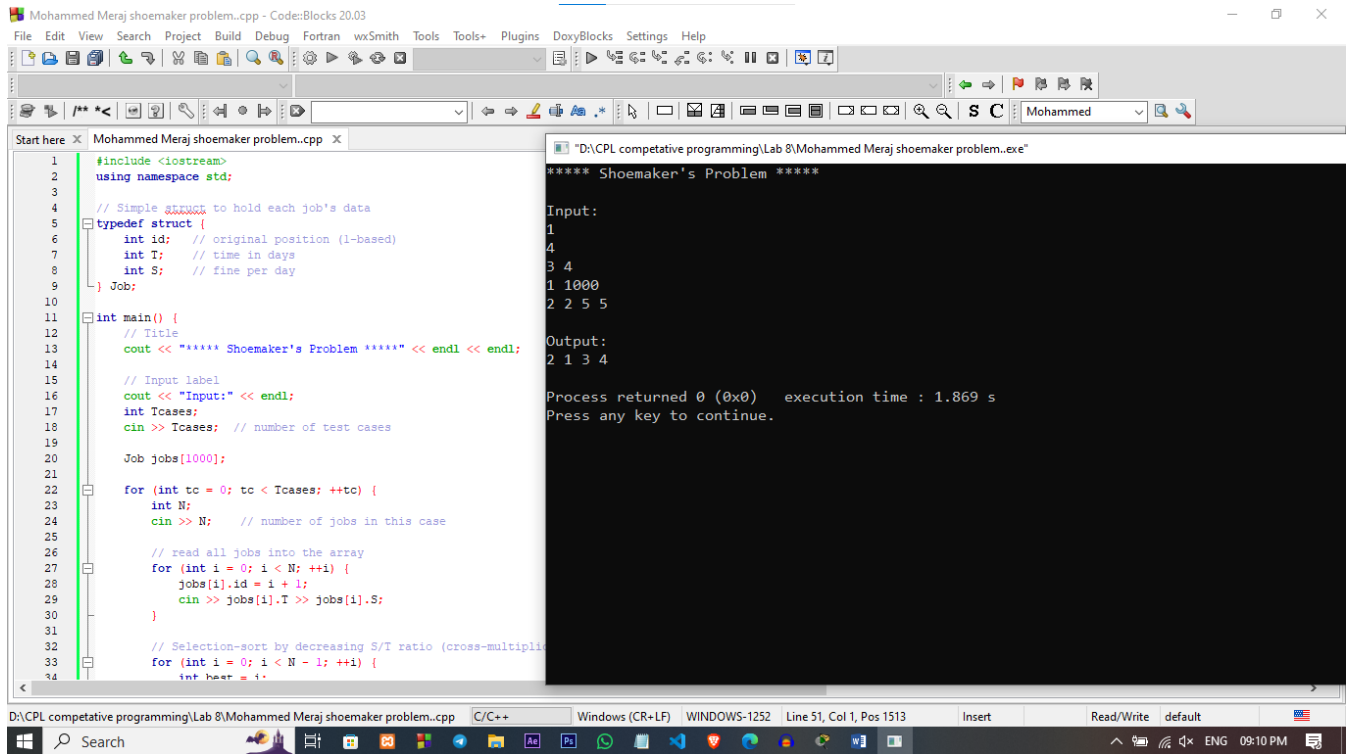
// Output label (once before first case's results)
if (tc == 0) cout << endl << "Output:" << endl;

// 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 :



The screenshot displays a C++ IDE with two windows. The left window shows the source code for 'Mohammed Meraj shoemaker problem.cpp', and the right window shows the execution output.

**Source Code (Mohammed Meraj shoemaker problem.cpp):**

```
1 #include <iostream>
2 using namespace std;
3
4 // Simple struct to hold each job's data
5 typedef struct {
6     int id; // original position (1-based)
7     int T; // time in days
8     int S; // fine per day
9 } Job;
10
11 int main() {
12     // Title
13     cout << "***** Shoemaker's Problem *****" << endl << endl;
14
15     // Input label
16     cout << "Input:" << endl;
17     int Tcases;
18     cin >> Tcases; // number of test cases
19
20     Job jobs[1000];
21
22     for (int tc = 0; tc < Tcases; ++tc) {
23         int N;
24         cin >> N; // number of jobs in this case
25
26         // read all jobs into the array
27         for (int i = 0; i < N; ++i) {
28             jobs[i].id = i + 1;
29             cin >> jobs[i].T >> jobs[i].S;
30         }
31
32         // Selection-sort by decreasing S/T ratio (cross-multiplication)
33         for (int i = 0; i < N - 1; ++i) {
34             int best = i;
```

**Execution Output (D:\CPL competitive 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.
```

The status bar at the bottom indicates the file path: D:\CPL competitive programming\Lab 8\Mohammed Meraj shoemaker problem.cpp, the language: C/C++, and the window title: Windows (CR+LF) WINDOWS-1252. The cursor is at Line 51, Col 1, Pos 1513.