Worksheet 2

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Branch: CSE

Section/Group: DWWC-43

Semester: 5

Date of Performance: 04-01-2023

Subject Name: Data Structure

1. Aim/Overview of the practical:

i) *CodeChef recently revamped its practice page to make it easier for users to identify the next problems they should solve by introducing some new features:*

- *Recent Contest Problems - contains only problems from the last 2 contests*
- *Separate Un-Attempted, Attempted, and All tabs*
- *Problem Difficulty Rating - the Recommended dropdown menu has various difficulty ranges so that you can attempt the problems most suited to your experience*
- *Popular Topics and Tags*

Our Chef is currently practicing on CodeChef and is a beginner. The count of 'All Problems' in the Beginner section is XX. Our Chef has already 'Attempted' YY problems among them. How many problems are yet 'Un-attempted'?

ii) Chef has two integers XX and YY. Chef wants to perform some operations to make XX and YY equal. In one operation, Chef can either:

- set $X := X + 1$ $X := X+1$
- or set $Y := Y + 2$ $Y := Y+2$

Find the minimum number of operations required to make XX and YY equal.

iii) There is a contest containing 22 problems AA and BB.
22 strong participants PP and QQ participated in the contest and solved both the problems.
PP made AC submissions on problems AA and BB at time instants P_AP_A and P_BP_B respectively while QQ made AC submissions on problems AA and BB at time instants Q_AQ_A and Q_BQ_B.

It is given that the time penalty is the minimum time instant at which a participant has solved both the problems. Also the participant with the lower time penalty will have a better rank.

Determine which participant got the better rank or if there is a `TIE`.

iv) In ChefLand, human brain speed is measured in bits per second (bps). Chef has a threshold limit of XX bits per second above which his calculations are prone to errors. If Chef is currently working at YY bits per second, is he prone to errors?
If Chef is prone to errors print `YES`, otherwise print `NO`.

v) Chef is watching TV. The current volume of the TV is XX. Pressing the `volume up` button of the TV remote increases the volume by 11 while pressing the `volume down` button decreases the volume by 11. Chef wants to change the volume from XX to YY. Find the minimum number of button presses required to do so

2. Steps for experiment/practical/Code:

i)

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

int main() {
	// your code goes here
	int x,y;
	cin>>x>>y;
	cout<<(x-y);
	return 0;
}
```

ii)

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

int main() {
        // your code goes here
        int t;
        cin>>t;
        while(t--)
        {
        int x,y;
        cin>>x>>y;
        int c=0;
        if(x<y)
        c=y-x;
        else if(x>y)
        {
           if((x-y)%2==0)
           c=int((x-y)/2);
           else
           c=int((x-y+1)/2)+1;
        }
        cout<<c<<endl;
        }
        return 0;
}
```

iii)

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

int main() {
        int t;
        cin>>t;
        while(t--)
        {
           int pa,pb,qa,qb;
           cin>>pa>>pb>>qa>>qb;
           int p=max(pa,pb);
           int q=max(qa,qb);
           if(p>q)
           cout<<"Q"<<endl;
           else if(p==q)
           cout<<"TIE"<<endl;
           else
           cout<<"P"<<endl;
        }
        return 0;
}
```

iv)

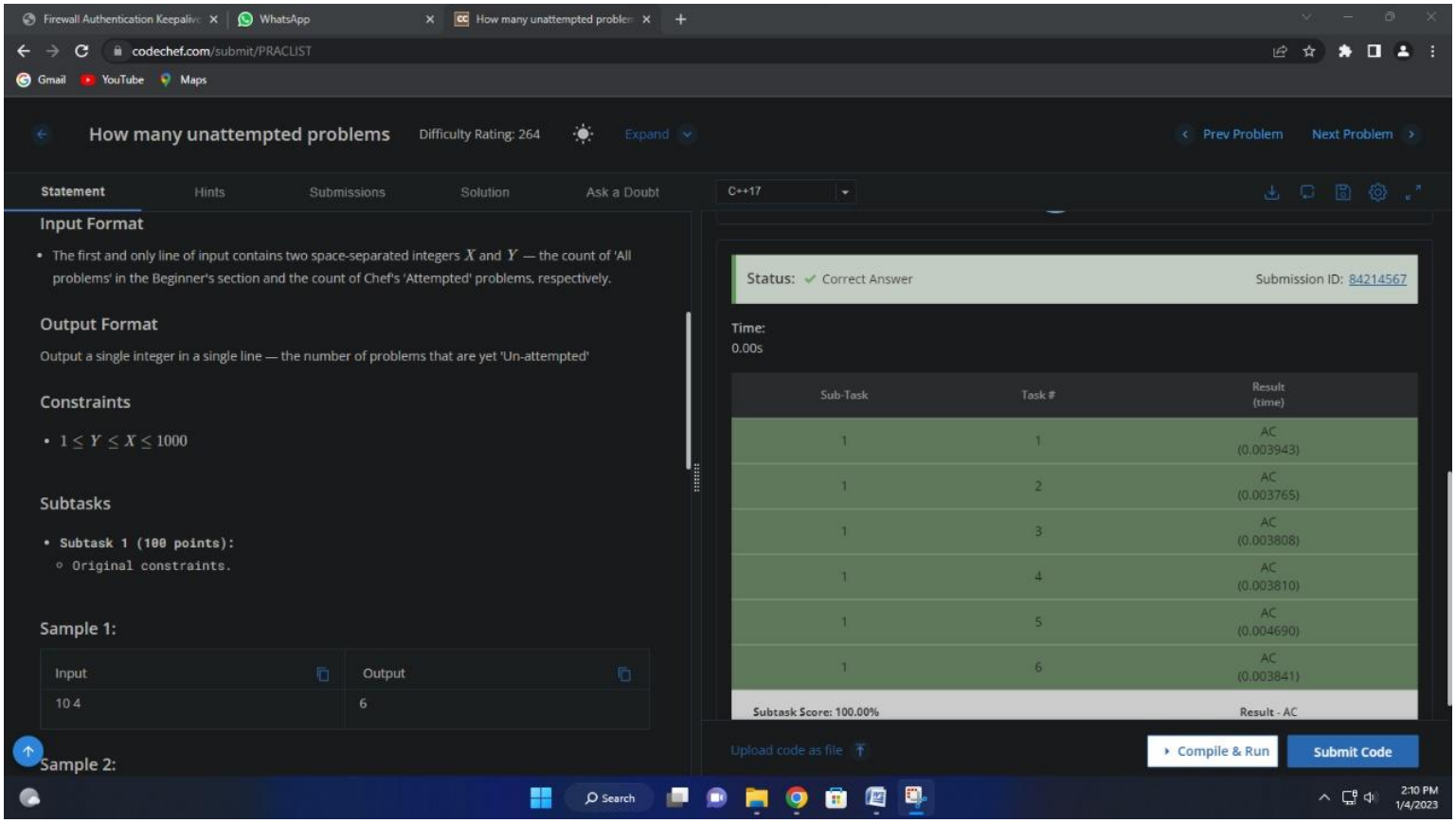
```
#include <iostream>
using namespace std;

int main() {
	int x,y;
	cin>>x>>y;
	if(y>x)
	cout<<"YES"<<endl;
	else
	cout<<"NO"<<endl;
	return 0;
}
```

v)

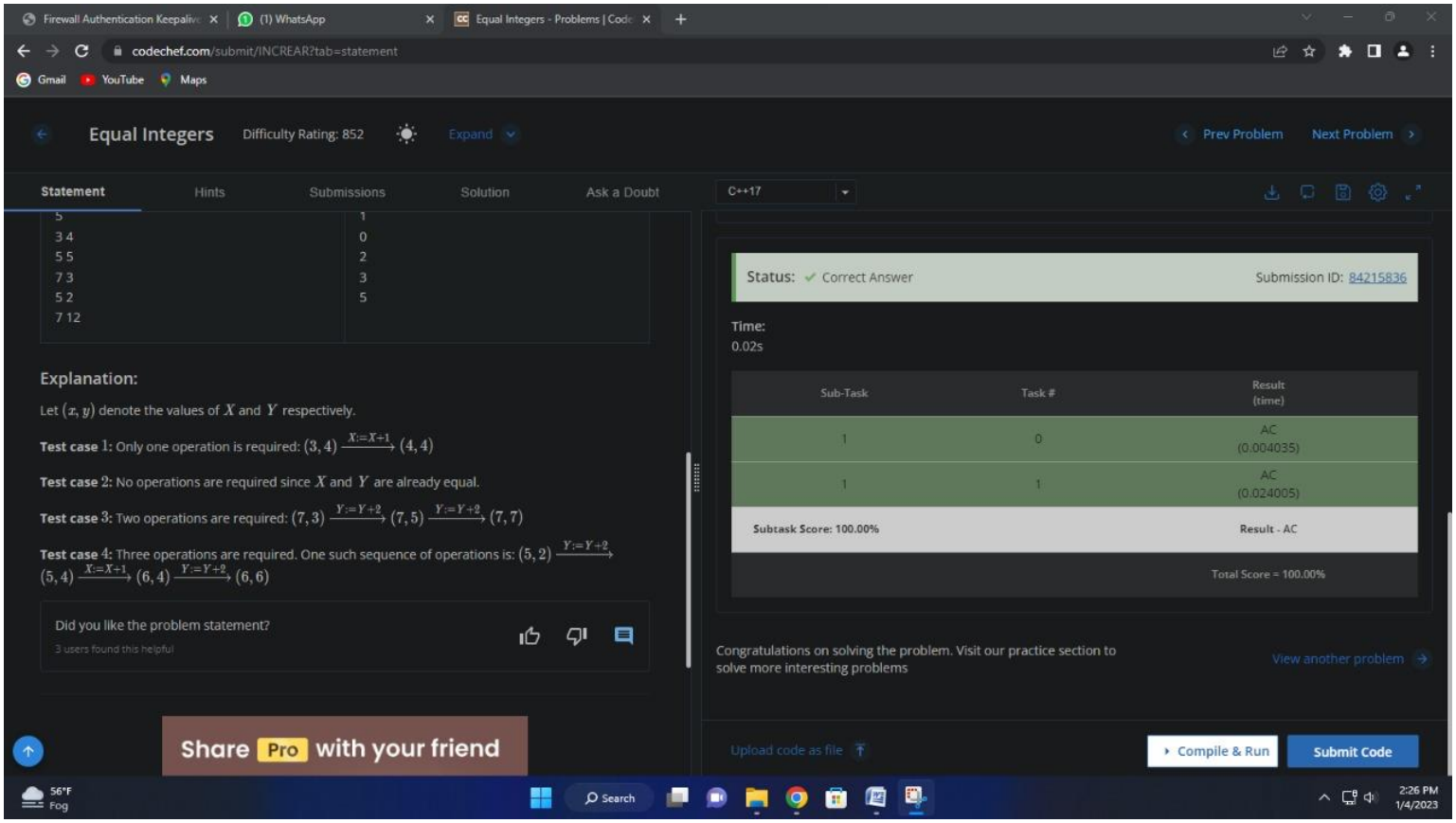
```
#include <iostream>
using namespace std;

int main() {
	int t;
	cin>>t;
	while(t--)
	{
	   int x,y;
	   cin>>x>>y;
	   cout<<abs(x-y)<<endl;
	}
	return 0;
}
```

3. Observations/Discussions/ Complexity Analysis:

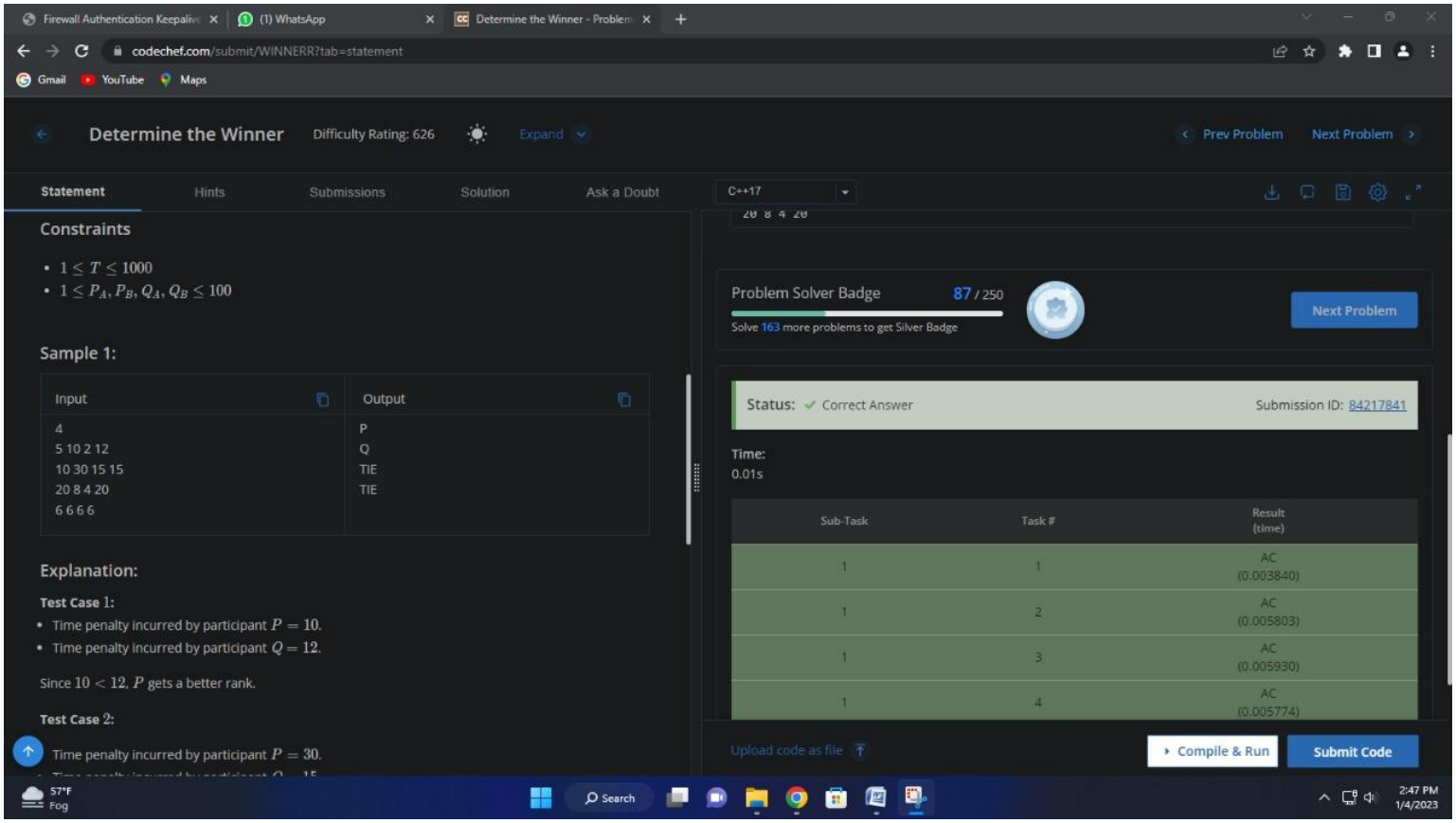
i)



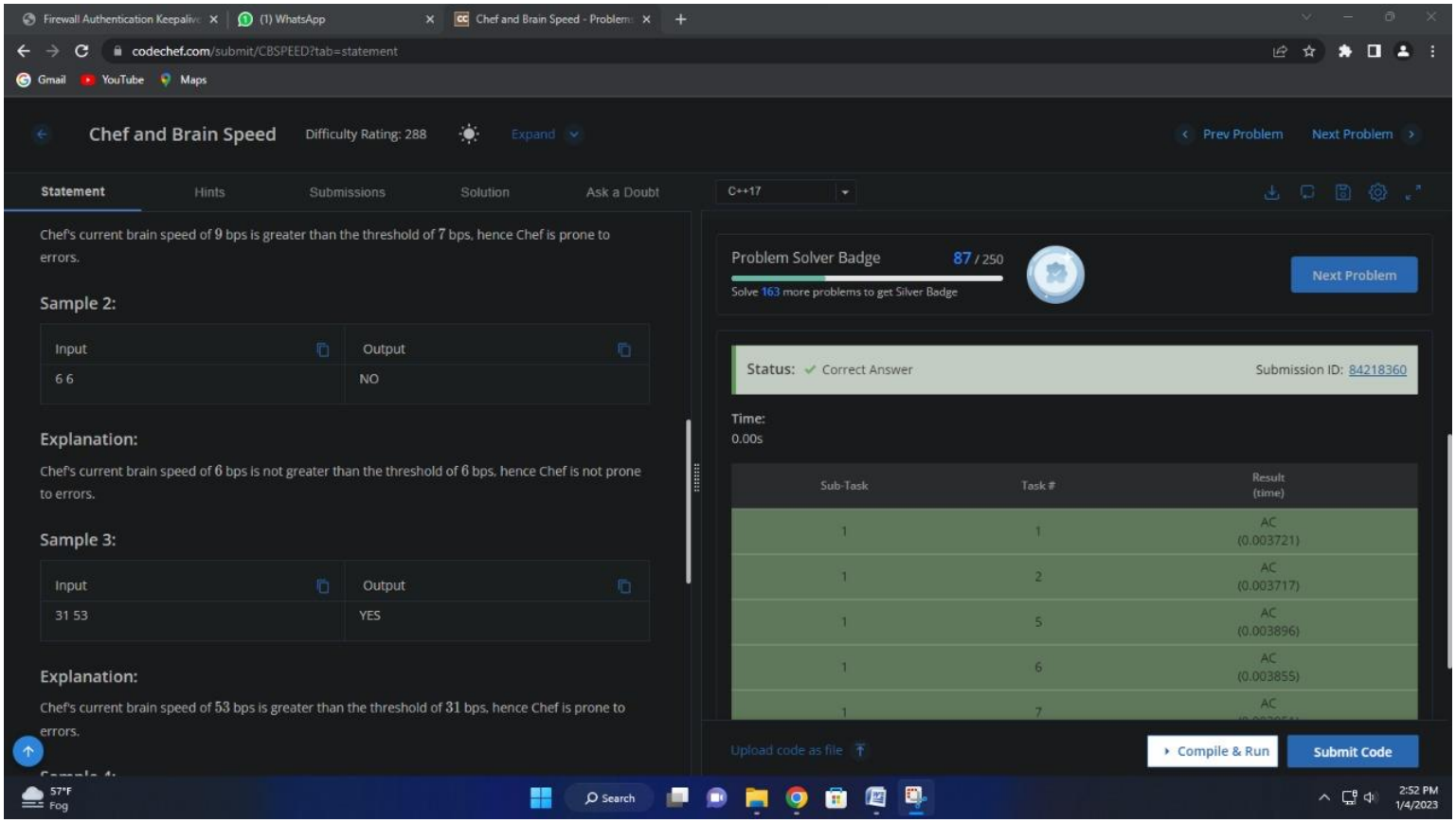
ii)


Firewall Authentication Keepalive
(1) WhatsApp
Equal Integers - Problems | Code
codechef.com/submit/INCREAR?tab=statement
Gmail
YouTube
Maps
Equal Integers
Difficulty Rating: 852
Expand
Prev Problem
Next Problem
Statement
Hints
Submissions
Solution
Ask a Doubt
C++17
5 1
3 4 0
5 5 2
7 3 3
5 2 5
7 12
Explanation:
Let (x, y) denote the values of X and Y respectively.
Test case 1: Only one operation is required: $(3,4) \xrightarrow{X:=X+1} (4,4)$
Test case 2: No operations are required since X and Y are already equal.
Test case 3: Two operations are required: $(7,3) \xrightarrow{Y:=Y+2} (7,5) \xrightarrow{Y:=Y+2} (7,7)$
Test case 4: Three operations are required. One such sequence of operations is: $(5,2) \xrightarrow{Y:=Y+2} (5,4) \xrightarrow{X:=X+1} (6,4) \xrightarrow{Y:=Y+2} (6,6)$
Did you like the problem statement?
3 users found this helpful
Share Pro with your friend
Status: Correct Answer
Submission ID: 84215836
Time:
0.02s
Sub-Task
Task #
Result (time)
1 0 AC (0.004035)
1 1 AC (0.024005)
Subtask Score: 100.00%
Result - AC
Total Score = 100.00%
Congratulations on solving the problem. Visit our practice section to solve more interesting problems
View another problem
Upload code as file
Compile & Run
Submit Code
56°F
Fog
Search
2:26 PM
1/4/2023

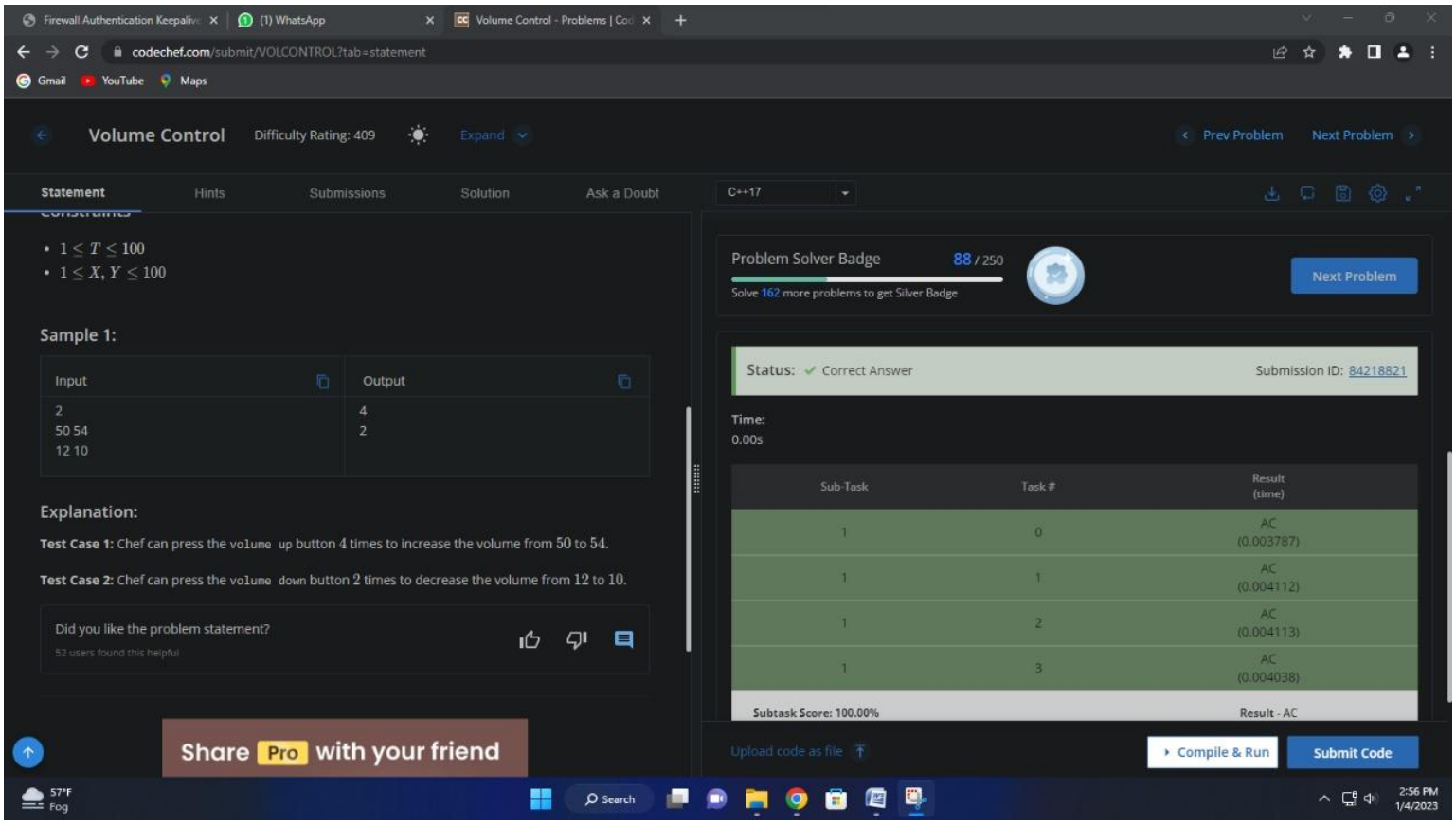
iii)


Firewall Authentication Keepaliv
(1) WhatsApp
Determine the Winner - Problem
codechef.com/submit/WINNERR?tab=statement
Gmail
YouTube
Maps
Determine the Winner
Difficulty Rating: 626
Expand
Prev Problem
Next Problem
Statement
Hints
Submissions
Solution
Ask a Doubt
C++17
Constraints
$1 \leq T \leq 1000$
$1 \leq P_A, P_B, Q_A, Q_B \leq 100$
Sample 1:
Input
Output
4
5 10 2 12
10 30 15 15
20 8 4 20
6 6 6 6
P
Q
TIE
TIE
Explanation:
Test Case 1:
Time penalty incurred by participant $P = 10$.
Time penalty incurred by participant $Q = 12$.
Since $10 < 12$, P gets a better rank.
Test Case 2:
Time penalty incurred by participant $P = 30$.
Problem Solver Badge
87 / 250
Solve 163 more problems to get Silver Badge
Next Problem
Status: Correct Answer
Submission ID: 84217841
Time:
0.01s
Sub-Task
Task #
Result (time)
1 1 AC (0.003840)
1 2 AC (0.005803)
1 3 AC (0.005930)
1 4 AC (0.005774)
Upload code as file
Compile & Run
Submit Code
57°F
Fog
Search
2:47 PM
1/4/2023

iv)


Chef and Brain Speed
Difficulty Rating: 288
Expand
Prev Problem
Next Problem
Statement
Hints
Submissions
Solution
Ask a Doubt
C++17
Chef's current brain speed of 9 bps is greater than the threshold of 7 bps, hence Chef is prone to errors.
Sample 2:
Input
6 6
Output
NO
Explanation:
Chef's current brain speed of 6 bps is not greater than the threshold of 6 bps, hence Chef is not prone to errors.
Sample 3:
Input
31 53
Output
YES
Explanation:
Chef's current brain speed of 53 bps is greater than the threshold of 31 bps, hence Chef is prone to errors.
Problem Solver Badge
87 / 250
Solve 163 more problems to get Silver Badge
Next Problem
Status: Correct Answer
Submission ID: 84218360
Time:
0.00s
Sub-Task
Task #
Result (time)
1 1 AC (0.003721)
1 2 AC (0.003717)
1 5 AC (0.003896)
1 6 AC (0.003855)
Upload code as file
Compile & Run
Submit Code

v)


Volume Control
Difficulty Rating: 409
Expand
Prev Problem
Next Problem
Statement
Hints
Submissions
Solution
Ask a Doubt
C++17
$1 \leq T \leq 100$
$1 \leq X, Y \leq 100$
Sample 1:
Input
2
50 54
12 10
Output
4
2
Explanation:
Test Case 1: Chef can press the volume up button 4 times to increase the volume from 50 to 54.
Test Case 2: Chef can press the volume down button 2 times to decrease the volume from 12 to 10.
Did you like the problem statement?
52 users found this helpful
Problem Solver Badge
88 / 250
Solve 162 more problems to get Silver Badge
Next Problem
Status: Correct Answer
Submission ID: 84218821
Time:
0.00s
Sub-Task
Task #
Result (time)
1 0 AC (0.003787)
1 1 AC (0.004112)
1 2 AC (0.004113)
1 3 AC (0.004038)
Subtask Score: 100.00%
Result - AC
Share Pro with your friend
Upload code as file
Compile & Run
Submit Code

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			