Take-off

Programming Contest

F A L L - 2 0 1 8

Problem Set Analysis

Organized By:

Daffodil International University

Department of CSE

CPC Computer & Programming Club

Platform:

CodeMarshal

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Chief Judge

Mohammad Mahmudur Rahman

Associate Professor (Adjunct)

Department of CSE

Daffodil International University

Word Finalist: 2007

CEO Codemarshal

Judges

Nesar Ahammed

Judging Director

Raihanur Rahman

Problem Reviewer
and
Judge

Mehedi Hasan

Problem Reviewer
and
Judge

Special Thanks To :

1) Mehedi Imam Shafi
2) Muhainminul Islam Jim
3) Debashish Saha Pranta
4) Mahmud Sajjad Abeer

For giving their valuable feedback on the problem set.
a nd also thanks to **Fuad Hasan** for the Front Page.

Problem A: It's on the house

Category: Input/Output

Problem Setter: Mehedi Imam Shafi

Analysis: Just copy and paste the given code in your program and then submit or just print "Rest in peace legend!\n" and submit.

Problem B: Tricking Steppenwolf!

Category: Simple math , If-Else

Problem Setter: Amina Ahmed Jaya

Alternate Writer: Nesar Ahammed

Analysis: First, sum up a,b,c. If the sum of a,b,c is equal to 3 then print "Become more powerful!" otherwise print "Loses his power!"

Problem C: Spiderman !!!

Category: Simple math, Evaluate Expression

Problem Setter: Ferdouse Ahmed Foysal

Analysis: Given two point's co-ordinate, just have to calculate the distance between two points from the equation. In C/C++

```
int X1,X2,Y1,Y2;
scanf("%d %d",&X1,&X2,&Y1,&Y2);
double distance = sqrt( (X2-X1)*(X2-X1) + (Y2-Y1)*(Y2-Y1) );
printf("%0.2lf",distance):
```

Problem D: The Wonder Equation

Category: math and if else

Problem Setter: Raihanur Rahman

Alternate Writer: Mehedi Hasan

Special Thanks: Nesar Ahammed

Analysis: We consider four variable of a quadratic equation all the values are given and but one out of three is negative and other is positive so we have to find the negative one.
If x is negative then print "**We can find the value of X using Bashkara's Formula.**

If a is negative then the formula is **a = - (b*x +c)/(x*x) .**

If b is negative then the formula is **b = - (a*x*x+c)/x .**

If c is negative then the formula is **c = -(a*x*x+b*x) .**

Problem E: Discount Calculator (DC)

Category: Math, Loop, Recursion

Problem Setter: Debashish Saha Pranta

Alternate Writer: Muhaiminul Islam Jim

Analysis: Suppose we have initially Taka 100 and we get an instant cashback of 30% while the purchase amount is greater than or equal to Taka 1.

After 1st Transaction: Purchase amount Taka 100 & Cashback is Taka 30.00.
After 2nd Transaction: Purchase amount Taka 30 & Cashback is Taka 9.00.
After 3rd Transaction: Purchase amount Taka 9 & Cashback is Taka 2.70.
After 4th Transaction: Purchase amount Taka 2.70 & Cashback is Taka 0.81.
After 5th Transaction: Purchase amount Taka 0.81 & there is no cashback because the purchase amount is less than Taka 1.

Now if we calculate total purchase amount we can get the result:(100 + 30 + 9 + 2.70 + 0.81 = 142.51).

Problem F: Shohomot Vai

Category: Adhoc, 2D Grid,

Problem Setter: Azharul Islam Tazib

Alternate Writer: Nesar Ahammed

Analysis: Read the grid as following, then **count** the number of occurrence of character **'A'** in that grid. Let denote, **count = total number of occurrence of character 'A'** then answer should be **count*k**. where **k** will be given in the input. then print "Sohomot Vai" **count*k** times.

```
char S[200];
int i,j;
int cnt = 0;
for(i = 0; i < n; i++) {
```

```
    scanf("%s", S);
    for (j = 0; j < m; j++) {
        if (S[j] == 'A') {
            cnt++;
        }

    }
}
```

Problem G: Even Punch

Category: Math

Problem Setter: Muhaiminul Islam Jim

Alternate Writer: Debashish Saha Pranta

Special Thanks: Nesar Ahammed

Analysis: Hope you already know that, if you subtract an even number from an odd then the resulting number is always odd. So, if you have an odd number and every time you subtract an even number from it, you can never reach to number 0. Now write down the binary of number 1 to 10 on a paper. In that time, you will notice that the last bit (rightmost bit) of all odd numbers are `1`. It means, it is possible to determine if a number is odd or even by checking the last bit only. If the last bit of a binary string is '1' then the number is odd and it means you can never reach 0, if the last bit of the binary is '0' then you may reach the number 0 after subtracting even numbers from the equivalent decimal of that binary string.

Problem H: The Dark Knight

Category: Basic Geometry, If-else, Adhoc

Problem Setter: Fuad Hasan

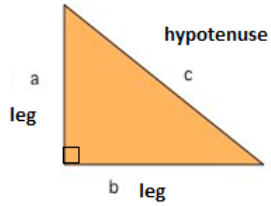
Alternate Writer: Mahmud Sajjad Abeer

Special Thanks: Nesar Ahammed

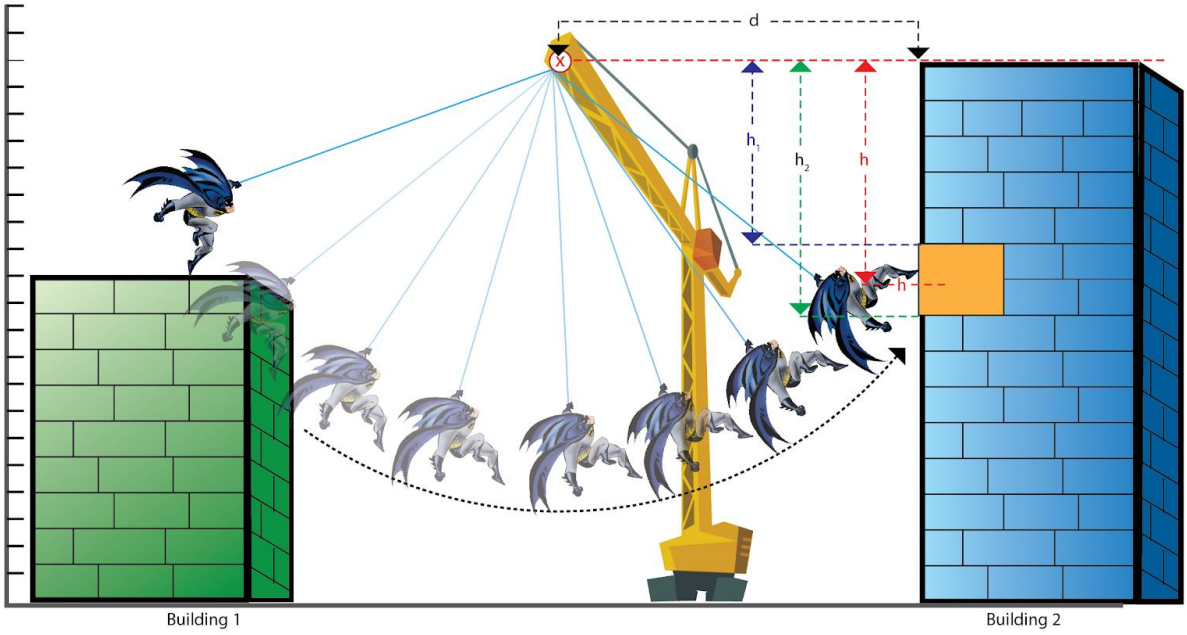
Analysis: Can you remember Pythagoras & his right-angled triangle formula?? This problem is based on it A right triangle consists of two legs and a hypotenuse. The two legs meet at a 90° angle and the hypotenuse is the longest side of the right triangle and is the side opposite the right angle.

The Pythagorean Theorem tells us that the relationship in every right triangle is:

$$a^2+b^2=c^2$$



On this problem we have **r** the length of the rope, the distance between the point X and the rooftop of the bank is **d.** Now if consider the **r** as the hypotenuse and **d** as one leg of a right angle triangle then we can say the other leg **h** is equal



$$h^2 = r^2 - d^2$$

Where h is the actual length from the rooftop of the building he can reach using the roop of the length r. Now if h is greater than h1 and less than h2, only for this case he can reach to the window.

Problem I: No Good In This GoodBye

Category: Stopper, String Processing, Implementation, Time-wasting-problem

Problem Setter & Dataset: Mahmud Sajjad Abeer

Alternate Writer: Pranto Das

Analysis: First, you need to differentiate the mentioned variables, integer literals & operators(A, B, C, D, E, F). Then, start checking for the verdict in order.

Compilation error, you just need to check if (4, 5, 8, 10)th lines contain semicolons and others don't. Any violation of that will lead to CE.

Runtime Error, i) There should be an "address of"('&') operator before 'n' on 5th line ii) If the condition is true, the increment segment of the loop shouldn't contain any divide by zero or mod by zero. Any violation of them will lead to RE.

Now, you need to run the loop following the given literals of a loop. Use a counter of operations and if the loop is ran more than 100 times, output "Time Limit Exceeded" immediately. Otherwise, check what is it printing and if it's always non-increasing. If it's decreasing then output "Wrong Answer" and "Accepted" otherwise. Good luck! Let me know after you solve it :P

***** Thank You *****
