

DIU Take Off Programming Contest, Spring 2018

Problem Analysis

Problem A: Jingalala's Google Interview

Category: Giveaway, simple loop, simple string, simple condition

Problem Setter: Mahmud Sajjad Abeer

Analysis: Just count the number of 'a' in the quoted passage and output 33(which is the count). That's it. Easy, huh??? :D The other way of doing that is, store the passage in a string like this:-
char s[1000]="....." and then loop through each character and count if the character is 'a' and finally output the count.

Problem B: Ghumkature Contestant

Category: Simple if/else

Problem Setter: Mehedi Hasan Shesher

Analysis: You are given a fixed time x. You just have to compare your input with this time. If x is greater than 71, print "Varsity Jao", otherwise print "Ghumao". And you have to print a newline after the output.

Problem C: DIU and Habibi's new craze

Category: Simple math

Problem Setter: Md. Ferdouse Ahmed Foysal

Special Thanks: Nesar Ahammed Jony

Analysis: You are given two lines Each containing two integers L and W .

Here, L = length of a building and W = width of a building. You have to find the total area of the university.

You just have to multiply L and W to find the area of each rectangle , and then the sum of the area of two rectangles is the total area of the university .

Problem D: Princess mAina (ময়না) and her boyfriends

Category: Simple Loop

Problem Setter: Muhaiminul Islam Jim

Alternate Writer: Mehedi Imam Shafi

Special Thanks: Nesar Ahmed Jony

Analysis: You are given the number of boys crushed on mAina and the number of her boyfriends, take that as input. Actually, the first number doesn't have any work to do in this

problem. :p Take the next line of input (time she passes with each of the bfs) using a loop. Store the index number of the maximum number (think how). Print it afterwards.

Problem E: Power of two

Category: Pattern Finding, Number Theory.

Problem Setter: Pranto Das

Alternate Writer: Nesar Ahammed Jony

Special Thanks: Muhaiminul Islam Jim

Analysis: We know, the value of a digit of a number equal to **digit * (base of the number)^{position}**.

Example : $(101)_{10} = (1*10^2 + 1*10^1 + 1*10^0)$ and $(101)_2 = (1*2^2 + 0*2^1 + 1*2^0)$.

So, in this problem ,for given **n** and you have to output $2^n = (?)_2$. From previous example it's clear that answer will be 1 and **n** number of zero. Suppose **n** = 3, $2^3 = (1*2^3 + 0*2^2 + 0*2^1 + 0*2^0) = (1000)_2 = (8)_{10}$

Problem F: Big Bang Theory

Category: Implementation, Brute-force, Nested loops

Problem Setter: Mahmud Sajjad abeer

Alternate Writer: Nesar Ahammed Jony

Analysis: Take input, initialize a variable now=1. Now, loop exactly P times and iterate through all the cells and check if the cell as any consecutive cell with value=now. If the condition matches, update the current cell's value with now+1 and move on. After iterating all the cells inside P's loop, increase now by 1. At the end you just have to output the same array, 1 for nonzero value and 0 for zero's.

Problem G: Olympiad

Category: Implementation

Problem Setter: Nesar Ahammed Jony

Alternate Writer: Pranto Das

Special Thanks: Muhaiminul Islam Jim

Analysis: The problem can be solved in different approaches. The simplest solution is to create a count array of size 100 as the elements of sets are in the range from 1 to 100. At first, you initialize zero to all elements of the Count array, you set $\text{Count}[x] = 2$ if both sets contain x, set $\text{Count}[x] = 1$ when elements x exists any one of the two sets. when an element doesn't exist on any of the two sets you set $\text{Count}[x] = 0$. Next

For Union, The idea is to iterate through the Count array you print an element **i** if the value of $\text{Count}[i]$ is greater than 0.

For Intersection, you print the element **i** if the value of elements $\text{Count}[i]$ is greater than 1.

This solution works in $O(n)$ time.

Problem H: What does it even mean?

Category: Stopper, String, Matching

Problem Setter: Mehedi Imam Shafi

Alternate Writer: Muhaiminul Islam Jim, Nesar Ahammed Jony

Special Thanks: Christopher D. Manning

Analysis: In first look it might appear to be very hard problem. But the problem is pretty straight forward. Can be solved as said. Only thing to keep in mind that the biggest word to count first. So while breaking the given query if loop starts matching from the right end it is easier to get the bigger word. So the easiest solution is to take the remaining complete string and matching with every word given as the dictionary and lessening the character from right end.

Problem I: Hardest Problem Ever!!! (Clickbait)

Category: Giveaway, simple output

Problem Setter: Mahmud Sajjad Abeer

Analysis: Just copy and paste the code in your program and then submit or just print "Great things take time" on your own way and submit.

Judge & alternate solutions can be found here:

<https://github.com/diu-take-off/Take-Off-Spring-2018>

#Success doesn't come to you, you go to it.

Chief Judge:-

Mohammad Mahmudur Rahman,

Associate Professor(Adjunct), DIU

CEO and Founder, MuktoSoft and CodeMarshal

ACM ICPC World Finalist, 2007

Former Judge ACM ICPC

Judges: Mahmud Sajjad Abeer, Muhaiminul Islam Jim, Nesar Ahammed Jony.

Special Thanks: Prof. Syed Akhter Hossain, Mohammad Mahmudur Rahman, CodeMarshal, Department of Computer Science & Engineering, DIU Computer & Programming Club.

Mahmud Sajjad Abeer

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