Ural Online Judge Hints

1347-1359 USU Junior Championship March'2005

A – 1347 – Blog

Simulate directly. You do not need to use Quick Sort to rearrange the name list for each person, for the data is small enough. There are no spaces in person's name and between "<" and ">".

B – 1348 – Set a wolf to keep the sheep

1. Calculate the distance between a point and a line.
2. Calculate the distance between a point to two ends of the segment, and choose the larger one.

C – 1349 – Farm

Enumerate directly. Be sure that you are using O(logn) algorithm to calculate the power function.

D – 1350 – Canteen

If the stuff which is dangerous for K^{th}(K>1) student is also dangerous for 1^{st} student, we will say that we can ignore the existence of this kind of stuff, for 1^{st} student is not poisoned. After the pre-process, if there is a student with NO dangerous stuff, we will say the dinner is harmless for him/her (output "YES").

Later we compare the number of dangerous stuffs for K^{th} student with the number of stuffs left (ignoring the stuffs which are dangerous for 1^{st} student). If K^{th} student HAS TO eat dangerous stuff, we say "NO", otherwise we say "MAYBE".

E – 1351 – Good Gnusmas - Dead Gnusmas

Use cross product will reduce the complexity of your programming.

F – 1352 – Mersenne primes

I searched the Internet and use "const"… I'm certain that calculate directly can get AC too.

G – 1353 – The milliard Vasya's function

Using a pure mathematical function will be a terrible mess. For this situation, recurrence is the best way☺

H – 1354 – Palindome. Again Palindome

I simply use enumeration + checking in $O(N^2)$ and get AC, for mostly the program will not take exactly $O(N^2)$. Pay attention that S2 is exactly NONEMPTY.

I – 1355 – Bald spot revisited

If B mod A<>0 Then Writeln(0) Else Writeln(number of prime factors of B/A).

J – 1356 – Something easier

- If the original number is a prime, just output it.
- If the original number if even, by Goldbach's conjecture, we only need 2 primes and sum them.
- If the original number is odd. We firstly check whether it is the sum of 2 and another odd prime. If it is not, it must be 3 plus an even number. Again by Goldbach's conjecture, we only need 3 primes.

But how to split an even number to two odd primes? By my research I found the number of 'prime pairs' for a single even number is very large. So I pre-build a small prime list, and check them one by one.

K – 1357 – Teakettle 1.0 for Dummies

We don't care who fills the teakettle since the earlier one comes, the earlier one goes away. That will make your programming much easier I think.

L – 1358 – Cables

Do simply DFS from any node and get a DFS-tree. We can place them line by line according to the distance from each node to the root. And one by one for each line, according to the order they are examined during the DFS. Hence we can place all of the points in NxN grids.

M – 1359 – Construction

Dynamic Programming. By law of conservation of energy, the object has the same speed at the same altitude. So we can use t[*i*][*j*] to denote the minimal time required from the original point to *i* meters left and *j* meters down. For the state transferring, you need to enumerate all the possible places of the last wooden plank.