Bernard's "Fake" Journal

Problem #1

95% Problem

Initial thoughts:

This problem has a fairly straightforward brute force solution. I can use a while loop because the stopping condition (average of 95%) is easy to test. All I need to do is find the new sum (actual marks plus a number of 10's) and divide it by the theoretical maximum total (10 x something). I can probably speed it up a bit by keeping track of the summed marks and summed totals (rather than recomputing).

Reflection:

Apparently, there's also a mathematical solution. I think the idea is that the total lost marks should be 5%. So, if I work out how many marks are lost, then work out what twenty times that number is, that should be the total marks I need. Fortunately, that is double the number of tens, so it works out as total marks lost times two. I should probably look for math solutions like this before just choosing brute force.

Problem #2

Initial thoughts:

This problem is definitely at most O(n) because you have to check each element in the fence string, so if I can find an O(n) brute force solution, I'm set. It is pretty easy to tell when a fence starts (could be anywhere) and fence ends (it didn't 'swap'). If I iterate through the string and check if the fence condition is valid (i.e. a swap) then I can increment the max fence value.

Reflection:

OK, so I should have only set the max fence value when the fence reset and only if it was longer than the previous fence maximum. I also should have had a current fence length which resets each time. Also, converting and comparing strings was a pain. I need to get more familiar with functions like strcmp so I can use them without looking them up.

Problem #3

Initial thoughts:

What was Bernard thinking. This is waaaay too hard. I needed several hints even to get started. I think brute force might work. Perhaps check every possibility. Use a for loop to iterate through the students and the devise a function to see if I can make a number X then test whether it is possible or not.

Reflection:

OK, brute force was a bad idea. I got a few hints and that led me down the right path. So it works this way. Because the two students whose numbers are not divisors of the 'big X' are standing next to each other, one or other must be an even number. This narrows down which two people can generate a valid X. If it's a number like 18, then X is divisible by 2 and 9 which means 18 is not valid (a number divisible by 2 and 9 is definitely divisible by 18). So that leaves powers of 2. If one of the students is a power of 2, the other must be a prime number one higher or lower than that number. So the solution is to find the biggest power of 2 less than n, then test the number above and below. Some have multiple solutions. I think I'm just going to have to do more problems like this before tricks like this click in my brain : \