Midterm 2 DataStructure and Algorithms

22/01/2023

Graded task 1 on Dynamic Programming.

Given a string *X* formed out of single-digit numbers from 0−9, you are given a set of digits *S* and you need to count the total substring of string *X* that contains all the digits in the set *S*.

Marks Distribution:

1. A correct algorithm:- 0.5 Points
2. The solution code:- 2 point
3. The time complexity: 0.5 points

Graded task 1 on Dynamic Programming.

Two friends decided to play a very exciting online card game. At the beginning of this game, each player gets a deck of cards, in which each card has some strength assigned. After that, each player picks a random card from his deck and they compare the strengths of the picked cards. The player who picked a card with larger strength wins. There is no winner in case both players picked cards with equal strength.

First friend got a deck with n cards. The i-th his card has strength a_i. Second friend got a deck with m cards. The i-th his card has strength b_i.

First friend wants to win very much. So he decided to improve his cards. He can increase by *1* the strength of any card for *1* dollar. Any card can be improved as many times as he wants. The second friend can't improve his cards because he doesn't know about this possibility.

What is the minimum amount of money which the first player needs to guarantee a victory for himself?

Marks Distribution:

4. A correct algorithm:- 0.5 Points
5. The solution code:- 2 point
6. The time complexity: 0.5 points