CSE 301 - Algorithm Analysis: Assignment

Deadline: 2.1.2023 23:59

Rule#1: Individual work. Plagiarism is not accepted, and once notified, the grade for the assignment will be automatically zero.

Rule#3: Please submit your file in a PDF format (-10 points when it is not in PDF) and include your student number at the beginning of your file name (-5 points when your studentID is not on anywhere in the document)

Suggestion: You can start a conversation on the questions on the team's general page and expect us to help. You can also message me or Gökhan Hoca if you can't proceed with your answer. However, we recommend you keep the questions the day before the deadline.

Please implement the following question from Midterm in a programming language. Prepare a PDF document that shows the implementation code (in your desired programming language) in the document in `10pt Consolas` font. Format the code in borders (select the text, click format from the menu, choose paragraph styles, and select Borders and shading. If you select all the borders, up, down, right, and left, with 1pt line, click apply). Your report should explain the algorithm and space analysis (best-, average-, worst-case) and its steps.

Problem:

Suppose that A is an array of n elements. Each element of A has some flavor; you cannot tell the flavors apart, but you know that one flavor is a strict majority. That is, there are strictly more than n/2 elements that have this one flavor. You can access a helper function called isMajority so that isMajority(A,x) returns True if x is an element of A with the majority flavor and False otherwise. Develop an O(n) complexity divide-and-conquer algorithm to return an element of the majority flavor.