

DSA Lab Final Exam (Fall 2022 - BSCS)

Allowed Time = 90 minutes

Version: X2

Instructions for Invigilators:

1. Students will have total 90 minutes to finish the whole exam.
2. It is up to the students to manage their time.

Instructions for Students:

1. There are only 2 questions in the exam.
2. Late submissions will **NOT** be considered.
3. Create as many classes and functions as required. Remember, one function for one functionality.
4. Plagiarism will not be tolerated in any case.
5. Use meaningful variable names, and take care of naming conventions and indentation.
6. The format of the name of your submission should be
 - *RegisterionNumber_Name_Course_Section.*
 - For eg: ***L1F13BSCS2124_MohsinAbbas_DSA_SEC_D***

Time allowed = 90 minutes;

Marks: 100 = 50 + 50

Question 1:

Imagine you are developing a program to manage a car rental service. Each car in the fleet is identified by a unique integer car ID. You decide to use a binary search tree to store the car IDs, with the integer as the key for each node. Write a C++ program that allows the user to add new car IDs to the fleet, search for a specific car by its ID, and display all the car IDs in the fleet in descending order.

Question 2:

Suppose you are working on a project that requires you to store a large number of students and their test scores. Your program should use an `unordered_map` to store the students and their total test scores, where the keys are the student names and the values are the total test scores.

Write a C++ program to implement the gradebook using an `unordered_map`. The program should support the following operations using a menu:

1. Insert a new student and their total test score into the gradebook
2. Delete a student and their total test score from the gradebook
3. Print the entire gradebook (i.e., all students and their total test scores)
4. Exit