BITP 2113 ALGORITHM ANALYSIS - PROJECT INSTRUCTIONS

You are required to create a group with minimum of 2 person and maximum of 5 person. Propose one System Management that will have the following functionalities.

1. Generation of **10,000 UNSORTED** data. Display the first 100 data. You may store your data either by using Array or Linked List. You should have at least minimum of 8 attributes data to represent your system.
   (Example – Student Information System - Attribute: MatrikNum, Name, Year/Sem, HPNum, CodeSubject, Marks, CGPA, Fee)
   **You can store the 10,000 data in Ms. Excel or Notepad before input into Array or Linked List.

2. Propose **TWO (2) SORTING** Techniques to **SORT** your **10,000 UNSORTED** data. Compare and display the runtime for **10,000 data** between the 2 techniques. Improve your program to calculate and display the total number of swaps for both of your sorting techniques. Display the first 100 sorted data.
   **Time taken in millisecond.

3. Propose **TWO (2) SEARCHING** Techniques to **SEARCH** 100 data from your **10,000** data. The Searching output for both techniques should also state whether the data **IS FOUND** or **NOT FOUND**. Compare the runtime between the 2 techniques. Propose an improvement to one of your searching technique. Display the output of your improvement to the searching technique.
   **Time taken in millisecond.

4. Propose **THREE (3)** other additional functionalities that represent your system.
   - Example - Student Information System:-
     i. Calculate Marks and Determine Grade for Subjects.
     ii. Calculate CGPA for the Semester.
     iii. Calculate the Payment for Study Fee based on Total Credit taken for the Semester.

COMPLETE PROGRAM:-

1. Use only C++ language.
2. Your program should have output presented using Menu and Sub Menu to maneuverer between the results output for all techniques and functionalities.

Complete Project Presentation (6 January 2025 until 10 January 2025)

Each group will present their complete program for all tasks and present the output for the results. Each team members should take the responsibility to present 1 task from the projects' functionalities.

Submission PROJECT REPORT:-
Upload document (.pdf or Ms. Word) containing the following information:-

1. Title of the System.

2. All group members' name and matrix number.

3. Introduction about your system. (minimum 300 words)

4. Briefly describe about all your systems' functionalities – each functions' description contain minimum 5 sentences in 1 paragraph (minimum 50 words for each functions).

5. Write the analysis for your techniques – **2 SORTING Techniques proposed**. Calculate the Growth Rate Function for the Worst Case Complexity (Big O) for the **2 SORTING** Techniques proposed. Show the steps of calculations for both techniques.

6. Write the reasoning of improvement for your program to calculate and display the total number of swaps for both of your Sorting techniques (50 words).

7. Write the analysis for your techniques – **2 SEARCHING Techniques proposed**. Calculate the Growth Rate Function for the Worst Case Complexity (Big O) for the **2 SEARCHING** Techniques proposed. Show the steps of calculations for both techniques.

8. Write what is the improvement made and the reasoning of the improvement to one of your searching technique (50 words).

9. Appendix A: Complete program.

10. Appendix B: User Manual for the system with all output for all your Searching and Sorting results and other systems' functionalities.

Only **ONE** person should represent the group to submit and upload the document into ULearn.

Dateline PROJECT REPORT Submission:-
Submit into ULearn →
At tab Menu **ASSESSMENT** → folder **PROJECT REPORT SUBMISSION**
By 17 January 2025 (Friday) before 6pm.