

National University of Computer and Emerging Sciences, Lahore Campus



Course Name:	Operating Systems - LAB	Course Code:	CL2006
Program:	BS(DS)	Semester:	Fall 2023
Duration:	1 Hour	Total Marks:	30
Paper Date:		Weight:	
Section:		Pages:	1
Exam:	Quiz 3		

Student : Name: _____ Roll No. _____ Section: _____

Instruction/Notes:

1. Understanding the question paper is also part of the exam, so do not ask for any clarification.
2. Talking/Discussion is not allowed. You are responsible for protecting your code and saving it from being copied. If you don't protect it all matching codes are considered copy/cheating cases.
3. Failure to observe above mentioned instructions will lead to a negative mark on the Exam.

Question 1: Parallel Data Exploration Quest

[Marks 30]

Imagine a land of Data Science wonders where students are about to embark on an exciting journey. Their mission: to decode the secrets hidden in a massive text file filled with thousands of numbers. But beware, this file has tricky -9999999 values, like little guardians protecting its mysteries. To conquer this challenge, students must create a clever program in C/C++ that ventures through four stages: Loading, Cleaning, Analysis, and Reporting.

Requirements:

1. **Data Loading (Thread 1):** Begin your quest by creating a thread that reads the entire text file, gathering the raw data, including those mysterious -9999999 guardians. This stage sets the stage for your epic adventure.
2. **Cleaning (Thread 2):** The journey gets more exciting as you encounter obstacles in the form of -9999999 values. Create a thread to carefully remove these guardians, cleaning the data to reveal its true potential. Discover hidden patterns by sorting numbers and removing duplicates. Be cautious and wait if the Data Loading thread is still on its way.
3. **Analysis (Thread 3):** With the data now polished, start the analytical phase of your quest. This thread will unravel the mysteries, calculating the mean, median, and standard deviation of the numbers. Take a moment to survey your achievements, waiting if the Cleaning thread is still overcoming challenges.
4. **Reporting (Thread 4):** As the sun sets on your data-driven adventure, compile the insights you've gained into a comprehensive report. This thread will craft the tale of your triumphs, writing the results into a new text file. Ensure patience as you wait for the Analysis thread to complete its final calculations.

Embark on this Parallel Data Exploration Quest, where each thread takes you a step closer to uncovering the secrets within the data's mysterious depths. May your code be strong, and your discoveries remarkable!

Note: Use system calls only for file handling.