National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Operating Systems - LAB	**Course Code:**	CL2006
	Program:	BS(DS)	**Semester:**	Fall 2023
	Duration:	45 mintues	**Total Marks:**	30
	Paper Date:		**Weight:**	
	Section:		**Pages:**	1
	Exam:	Quiz 4		

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 Even Number Removal with Memory Mapping   **[Marks 30]**

Develop a C/C++ program that takes a file name as a command-line argument, loads its content into memory using memory mapping, and efficiently removes all occurrences of **even numbers**. The program should utilize two threads, with each thread responsible for processing half of the file's 200 elements concurrently.

After the threads complete their operations, the program should directly display the updated content of the file, showing the removal of even numbers. Ensure that modifications made by the threads are appropriately synchronized to the memory map, reflecting the changes in the original file.

Note: You can only use **open** system call in file handling.