LAB SESSION 08

Open Ended Lab

OBJECTIVE

The objective of this lab is to evaluate the students' ability to apply, integrate, and implement the concepts and skills acquired in the previous seven lab sessions by designing and developing a practical application using multiple data structures. The lab will assess problem understanding, algorithm design, implementation accuracy, creativity, and documentation quality.

EVALUATION METHOD

Students will be evaluated through open-ended problem-solving tasks using the OEL rubrics (5 marks) with criteria levels 0 and 1.

1. Each criterion in the rubric carries 1 mark.
2. A "1" indicates the student has fully met the criterion, while a "0" indicates it has not been met.
3. The final OEL score is the sum of the marks obtained out of a maximum of 5 marks.
4. These marks contribute to the continuous assessment component of the course.

TASKS

Design and implement a program for a library management system that:

1. Uses an array to store the list of available books (Lab 1 & Lab 2).
2. Maintains a queue of students waiting for a book (Lab 6 & Lab 7).
3. Uses a stack to track the borrowing history (Lab 5).
4. Uses a linked list for managing active borrowers (Lab 3 & Lab 4).

The program should integrate these structures, allow issuing and returning of books, manage waiting lists, and maintain borrowing history.

EXPECTED OUTPUT

- Display initial list of available books.
- When a book is issued:
  - If available → remove from array and record in stack.
  - If not available → enqueue the student into waiting list.
- When a book is returned:
  - Pop from the stack and return it to the available list.
  - If students are waiting → issue to the first in queue.
- Display all structures on request.

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Department of Software Engineering
OEL RUBRICS
(SE-213) Data Structure Algorithm & Application

Criteria	Achieved (1)	Not Achieved (0)	Marks
Problem Identification	Able to correctly identify the problem(s) and all required data (input and output)	Not able to correctly identify the problem(s) and all required data (input and output).	
Problem Solving Skills	Uses an effective strategy to solve the problem(s) and clearly identifies the steps	Uses an ineffective strategy to solve the problem(s) and completely misses the steps	
Implementation & Debugging	Efficient implementation and excellent debugging skills. Solution works without any error	Incomplete implementation and ineffective debugging skills. Major errors in the implementation.	
Deliverable(s)	Generates correct and complete output.	Cannot generate the desired output.	
Depth of Knowledge	Thorough grasp of the concepts covered in the lab and can apply it in real-life situations	Does not grasp the concepts covered in the lab and cannot identify any real-life application	
Weighted CLO Score			
Remarks and Signature			