

# Programming Fundamentals Lab (CL1002)

Date: 14/Oct/2024

Course Instructor(s)

Shaheer Ahmad Khan

## Lab Mid Exam (A)

Total Time: 90 minutes

Total Marks: 20

Total Questions: 03

Semester: FL-2024

Campus: Karachi

Dept: Software

Engineering (SE)

### Submission Instructions:

- You must comment your student ID on top of each file. (Line#1 of your code).
- Name the file for each question according to Roll\_No e.g. k24-xxxx\_Q1.c, k24-xxxx\_Q2.c etc.
- Submission is via a client software so open the application present on the Desktop.
- Enter your username as 24K-xxxx and its assigned password (Default is Fast1234).
- Submission is timed so after the time no submission will be accepted.

Student Name

Roll No

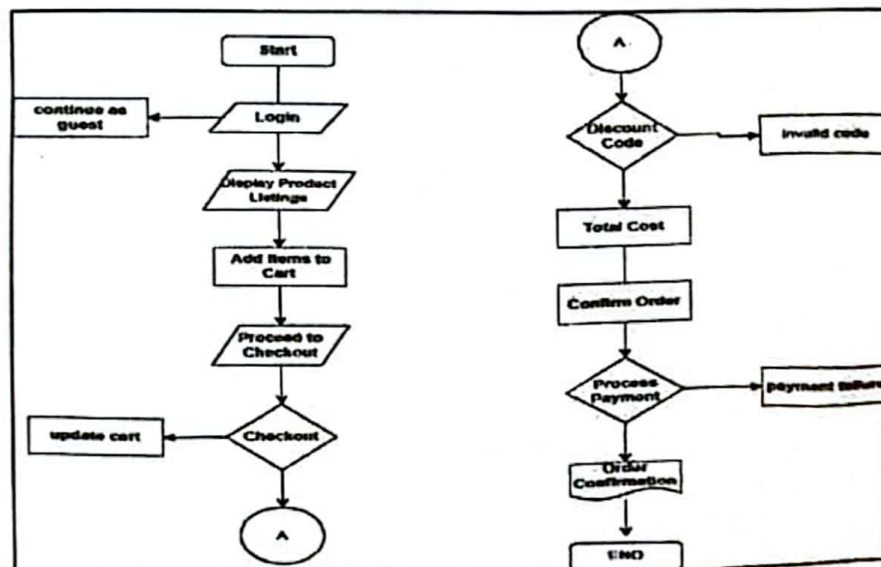
Section

Student Signature

**CLO # 1: Understand and Analyze flowcharts, PAC (Process-Activity-Control) charts, and IPO (Input-Process-Output) models to represent system workflows and these diagrams into algorithm and pseudocode implementation.**

**Q1.** You are designing an e-commerce platform that allows users to browse products, add items to their cart, and proceed to checkout. Users can either log in or continue as guests. After adding items to the cart, they proceed to checkout, where they can apply discount codes. If a valid discount code is entered, the total cost is updated accordingly. Once the order is confirmed, the system processes the payment. If the payment is successful, an order confirmation is generated. In case of a payment failure, users are prompted to retry. From the given flowchart your task is to write a pseudocode.

[5 Marks]

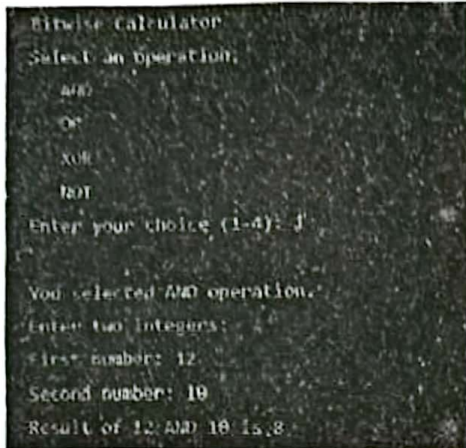


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**CLO # 2: Gain hands on experience in writing code that provides the use of logical and bitwise operators to perform efficient data manipulation, and apply decision and nested decision structures in control flow to create dynamic, condition-based logic within C-code**

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**Q2.** Create a bitwise calculator in C that supports AND, OR, XOR, and NOT operations. Based on user input, the program should ask for two numbers if the operation requires it (AND, OR, XOR) or only one number if it's a NOT operation. Use a nested decision structure to guide the user through the options, and display the result after performing the selected bitwise operation. **[7 marks]**



```
Bitwise Calculator
Select an operation:
AND
OR
XOR
NOT
Enter your choice (1-4): 1

You selected AND operation.
Enter two integers:
First number: 12
Second number: 10
Result of 12 AND 10 is 8
```

Bitwise Calculator  
Select an Operation  
AND  
OR  
XOR  
NOT  
Enter your choice: 1

You selected AND operation  
Enter two integers:  
First number: 12  
Second number: 10  
Result of 12 AND 10 is 8

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**CLO # 3: Understand and implement code utilize loops for iteration and arrays for data storage and manipulation, demonstrating efficient traversal and management of elements in C-code, while optimizing control flow and enhancing program efficiency.**

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**Q3.** You are designing a system for a local library to manage their collection of book IDs. The library needs to ensure that their records contain unique book IDs and that no duplicates exist in their system.

Write a program that will help the library maintain this uniqueness. The system should prompt the librarian to enter the total number of book IDs they wish to input, followed by the book IDs themselves. The program will then check for any duplicate entries and remove them, ensuring that only unique book IDs are stored. Finally, the program should display the updated list of unique book IDs. **[8 Marks]**

**Input:**

Enter the total number of book IDs: 6  
Enter Book ID 1: 101  
Enter Book ID 2: 203  
Enter Book ID 3: 101  
Enter Book ID 4: 456  
Enter Book ID 5: 203  
Enter Book ID 6: 789

**Output:**

Original list of book IDs: 101, 203, 101, 456, 203, 789  
Updated list of unique book IDs: 101, 203, 456, 789