

Software Construction & Development (SE3001, SE3005)

Sessional-I Exam

Date: September 23, 2025

Course Instructor(s)

Dr. Farooq Ahmed

Total Time: 1 hour

Total Marks: 30

Total Questions: 3

Roll No

Section

Student Signature

Do not write below this line

Attempt all questions on the answer sheet

CLO 1: Apply software engineering concepts to construct (i.e. design, develop, and test) software in team setting

Question 1

[10 marks]

Specify a **generic** interface **Stack** and then implement a class **ListStack** that provides Last-In-First-Out storage of an infinite size. The following operations shall be supported:

1. **push**: add an element to the top of stack and increment the size
2. **pop**: removes an element from the top of stack and decrement the size
3. **peek**: returns the element at the top of stack without removing
4. **size**: returns the current size of the stack

Question 2

[10 marks]

Consider a simple GUI to save the contacts information to a file.

Name: Email:

Write Java Swing based code to:

- programmatically construct and display this GUI as shown in the picture above
- Add button **appends** the contact information (name and email) to a file **Contacts.txt** in CSV (comma-separated values) format

Note: A label (e.g. Name or Email) can be represented as a **JLabel**, text field as **TextField** and button as **Button**

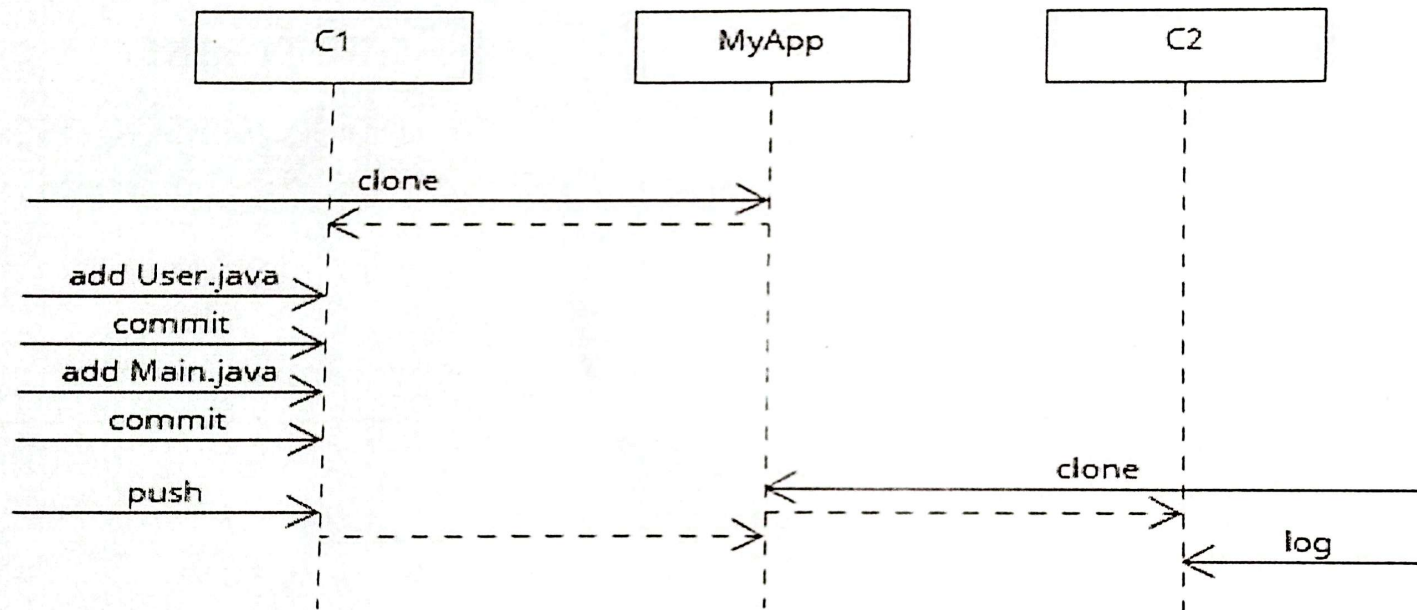
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CLO 4: Use a version control system as a part of software construction activity

Question 3

[10 marks]

Consider the following sequence diagram that describes the state of a Git Repository (MyApp) and two of its clones (C1 and C2):



(a) Assuming all development happens on the main/master branch, what sequence of operations will be required if a developer wants to add a **LoginForm** and update its instantiation in **Main.java** in **C2** and then reflect the changes in **MyApp**?

(b) What is the concept and benefit of feature branches and how can that be applied in this scenario?