

Advanced Programming (OOP) Lab

Assignment–9

Report Instructions

This document specifies the mandatory structure and assignment-specific questionnaires for the handwritten report corresponding to Assignment–9: Android App Development. The report will be evaluated for understanding of Android application structure, activity lifecycle, event handling, and separation of UI and logic.

General Submission Rules

- The report must be handwritten and submitted individually.
- Do not rewrite full Android source files; include only short, relevant code fragments.
- Explanations must focus on Android concepts, not IDE usage.
- All implemented requirements, exercises, and bonus tasks must be reflected in the report.
- Screenshots alone without explanation will not be awarded credit.

Section A: Android Application Structure

Describe the overall structure of the Android application. Explain the role of the MainActivity, layout XML file, and resource system. Clarify how Java/Kotlin code is connected to UI components.

Section B: Activity Lifecycle Understanding

Explain the Android activity lifecycle. Identify which lifecycle method is used in this assignment and why. Describe what would happen if the app is paused or restarted.

Section C: UI Components and Layout Reasoning

For EditText, Button, and TextView:

1. Explain the purpose of each component.
2. Describe how user input flows from UI to application logic.
3. Justify the chosen layout structure.

Section D: Event Handling and Validation Logic

Explain how button click events are handled. Describe how input validation is implemented and why it is necessary. Explain how feedback is provided to the user.

Section E: Intents and Navigation

If a second activity is implemented:

- Explain how Intents are used for navigation
- Describe how data can be passed between activities
- Explain what happens when the back button is pressed

Section F: Data Persistence Reasoning

If SharedPreferences or file storage is used:

- Explain how data is stored persistently
- Describe when data is read and written
- Explain how consistency across app restarts is ensured

Section G: What-If Design Analysis

Answer any two of the following:

1. What issues arise if all logic is placed inside onCreate()?
2. How would the design change if multiple activities are added?
3. What breaks if long operations run on the UI thread?
4. How does orientation change affect activity state?

Section H: Individual Extension Explanation

Describe one individual enhancement implemented, such as:

- Clear/reset functionality
- Language selection
- Custom theme or styling

Explain how this extension affects user interaction and app behavior.

Section I: Debugging and Learning Reflection

Describe one Android-specific issue encountered (lifecycle bugs, UI issues, crashes). Explain how it was diagnosed and what conceptual understanding improved.

Section J: AI Usage Disclosure

Declare whether AI or online tools were used. Clearly specify:

- Which part of the Android logic or UI was assisted
- How correctness and runtime behavior were verified