📘 Mobile Application Testing Lab – REPORT

Experiment Title

Dynamic Analysis of Android Application using Emulator and ADB

Student Name: Priyank Kumar

Lab Number: 5 – Mobile Application Testing

Tools Used: Android Emulator, ADB

Platform: Kali Linux

🎯 Objective

To perform dynamic analysis of an Android application by installing and running an APK inside an Android emulator and preparing the environment for runtime security testing.

🛠️ Environment Setup

- Operating System: Kali Linux

- Android Emulator: Google Android Emulator (API 30)

- Execution Mode: Software Emulation (No KVM acceleration)

- ADB Version: Android Debug Bridge (ADB)

⚙ Procedure Followed

Step 1: Android Emulator Setup

The Android emulator was installed using the Google Android Emulator installer. Environment variables for `ANDROID_SDK_ROOT`, `emulator`, and `platform-tools` were configured.

Step 2: Emulator Launch

The emulator was started using software rendering due to the absence of hardware virtualization support:

```
emulator -avd Pixel_4_API_30 -accel off -gpu swiftshader_indirect
```

⚠ Issue Encountered

Emulator Not Responding

During dynamic operations (ADB interaction and service initialization), the Android emulator repeatedly displayed a **"System UI is not responding"** message.

The issue persisted even after waiting, indicating instability caused by:

- Software-based emulation

- No KVM / VMX hardware acceleration

- High CPU usage during Package Manager initialization

🔍 Observation

- Android UI loaded successfully

- ADB connection was intermittent

- Package Manager service failed to initialize consistently

- Emulator became unresponsive during system-level operations

📌 Root Cause Analysis

The Android emulator requires hardware acceleration (KVM) for stable execution. Running the emulator in software mode caused system services such as Package Manager to stall, leading to repeated "Not Responding" errors.

✅ Conclusion

Dynamic analysis using an Android emulator without hardware acceleration is unreliable. The emulator instability prevented successful APK installation and runtime interaction. Therefore, further dynamic testing was shifted to **real-device-based and static analysis approaches**.

📊 Lab Log Table

Test ID	Activity	Result
016	Emulator Setup	Success
016	ADB Connection	Partial
016	APK Installation	Failed
016	Dynamic Analysis	Blocked (not responding)

✔ Final Status

✔ Emulator tested
✔ Root cause identified
✔ Alternative testing approach adopted