**iHub Anubhuti- IIITD Foundation**

**CHANAKYA Fellowship Program**

**Name of the Applicant:** Mayank (MT23045).

**Project Title:**

Android & iOS SIP application.

**Aim:**

The aim of this project is to develop a mobile application for Android and iOS platforms using an open-source SIP client called Linphone, integrated with Firebase Cloud Messaging (FCM) to enable push notifications.

**Methods:**

**Client Application (**Linphone VoIP**):**

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- The Linphone VoIP client application running on Android devices will be Integrated with Firebase Cloud Messaging (FCM) SDK to receive push notifications.
- Registers with FCM to obtain a device registration token.
- When the application is in the background, it relies on push notifications from the server to wake up and handle incoming calls.

**Server Side(**Spring Boot Application**):**

- Acts as the backend server responsible for sending push notifications to client devices.
- Handles registration of device tokens and sends notifications when there's an incoming call.
- Consists of the following components:
    - Controller Layer: Defines RESTful endpoints for handling device token registration and notification sending.
    - Service Layer: Implements business logic for interacting with Firebase Cloud Messaging and managing device tokens.
    - Firebase Admin SDK Integration: Integrated with the Firebase Admin SDK to send push notifications to client devices via FCM.
    - Database: Stores device tokens for registered users, allowing the server to target specific devices with notifications.

**Notification Handling:**

- When an incoming call event occurs in the Linphone VoIP server, it triggers a notification to be sent via the Spring Boot backend.
- The Spring Boot server receives the call event notification and identifies the target devices (using stored device tokens).
- It then sends push notifications to the targeted devices using the Firebase Admin SDK.
- The push notification contains data indicating that there's an incoming call, prompting the Linphone VoIP client application to wake up and handle the call.

**Client Interaction:**

- Upon receiving the push notification, the Linphone VoIP client application wakes up or is brought to the foreground.
- It processes the notification and handles the incoming call, allowing the user to answer or reject the call as appropriate.

**Deliverables and Milestones:**

- Project Setup: Set up development environments for Android, and fetch Linphone source code from GitHub and sync the project into the environment.
    - Milestone: Completion of set up of Android development environment.
- Firebase Integration: Configure Firebase projects for Android, and integrate FCM into the applications.
    - Milestone: Successful registration of devices with FCM and receipt of test notifications.
- Server Development: Develop the server-side component to handle incoming requests and send push notifications via FCM.
    - Milestone: Completing server-side code for handling incoming requests and sending push notifications.
- Integration with Linphone: Modify Linphone applications to make HTTP requests to the server for inbound calls.
    - Milestone: Successful integration of Linphone applications with the server for call notifications.
- Notification Handling: Implement client-side logic in Linphone applications to handle incoming push notifications.
    - Milestone: Display of push notifications for incoming calls with appropriate UI elements.

- Testing Phase: Conduct extensive testing of the application to ensure the reliability and proper functioning of push notifications.
    - Milestone: Completion of testing phase with successful delivery of push notifications on incoming call.