



FACULTY OF SCIENCES, TECHNOLOGY INNOVATION

INFORMATION AND COMMUNICATION TECHNOLOGY

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ASSIGNMENT TITLE : DEVELOP A NOTEPAD APP

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INTRODUCTION

I developed this app as a startup to better understanding mobile app development. I have learnt using android studio, jetpack compose and room database. It is a simple note taking application that supports user login, allowing users to create, edit, view and remove their notes.

With this project I have learnt good programming practices which include the separation of concern (SOC), single responsibility principle (SRP) and the use of defined functions (UDFs).

1.0 MAIN FEATURES

Login: A user enters a name and then taps a login button. Each signed user is presented with a sign-out option.

Creating notes: Users are able to create notes. The interface for creating a new note has a title, body text and an optional attachments such as images or other files.

Viewing notes:

They can also view a list of notes that can be scrolled. For a new screen without notes the app displays a friendly message asking a user to tap a + icon so they can add a note.

Updating notes: The existing notes can be updated by tapping on the edit option.

Removing notes: The existing notes can be deleted permanently by tapping a delete option.

Data persistence:

There is no special database for storing notes, instead all user data is stored locally using jetpack room. This makes the data to be restored even if the app crashes or restarts.

User interface:

Using jetpack compose helped me to come up with an intuitive user interface. Components used include Material design tools such as Scaffold, TopAppBar, FloatingActionButton and ElevatedCard. These components were used for a better user experience. I also updated the application's icon rather than android's defaults.

2.0 GOOD PROGRAMMING PRINCIPLES

(a) separation of concern

- **UI Layer:** This consist of composables including NotesScreen, SignInScreen, EditNoteScreen) to present a user with interactive screens

- **View Models:** These are used to manage the state of the application and interact with the data repository.
- **Repository layer:** This consists of logic for access and storage of notes in Room
- **Data Layer:** It has NoteDao, NoteEntity and NoteDatabase that handle persistence

The SOC ensures that a layer is confined within its specific task, making the application easier to maintain.

(b) Single responsibility principle (SRP)

Classes and functions have independent specific purposes.

- AuthViewModel handles login state
- NoteViewModel handles note crud (Create, Read, Update and Delete) operations.
- NotesDao consists of methods to access data
- IS screens presents content and invokes actions.

(c) Use of defined functions

To prevent duplicates and improve usability I defined functions for each specific action.

- saveNote manages creating new note and updating the existing notes. It contains user input fields such as title, body and image.
- deleteNote () removes existing note from repository.
- onAdd(), onEdit(), onSignout() functions are passed to UI tools for navigation.

3.0 CHALLENGES ENCOUNTERED AND SOLUTIONS

1. Dependency errors

I encountered unresolved references for KSP, Coil and Navigation despite successfully adding their dependencies in build.gradle.kts. To resolve I updated build.gradle.kts to use ksp version that is compatible with the latest Kotlin eg., 2.0.21 – 1.0.27 and added the missing coil dependencies.

2. stateFlow and state mismatch.

The NoteViewModel exposed StateFlow<List<Note>> yet the UI required State<List<Note>> the solution was to use collectAsState(initial = empty()) function inside the composable to convert StateFlow into a compose friendly state.

3. Experimental API

I encountered an error with using Material 3 API called TopAppBar as it is experimental in android. To resolve I annotated with `@OptIn(ExperimentalMaterial3Api::class)` feature above this API

4. Icon of the application

Initially the app used default icon for Android launcher. I created an icon image using resources in Android Studio's Image Asset tool that replaced the default launcher

5. Other errors

Some syntax related errors were encountered. To resolve I had to search for relevant topic in forums on google. References are included at the end of this report.

4.0 CONCLUSION

I have advanced my knowledge and programming skills with this project. I understand practically that SOC, SRP and UDF makes a project organized, modular and easier to maintain.

This app can be upgraded by adding features such as search, and cloud synchronization

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