



Cross Platform Application Development



BITS Pilani

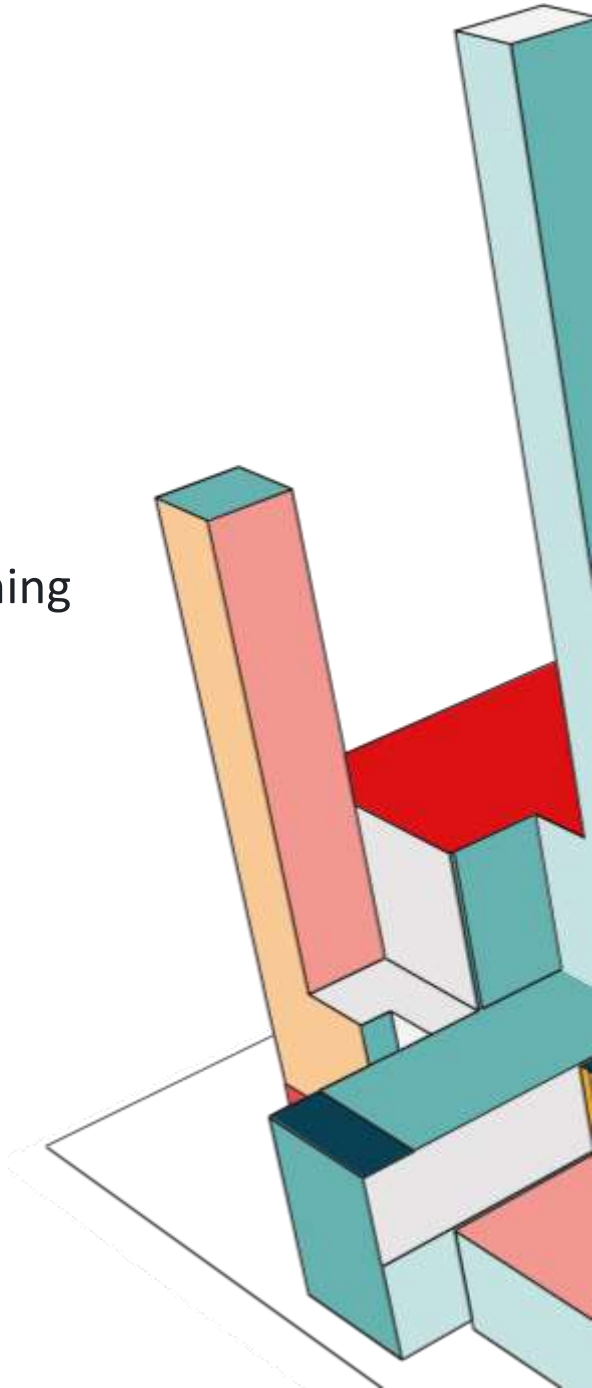
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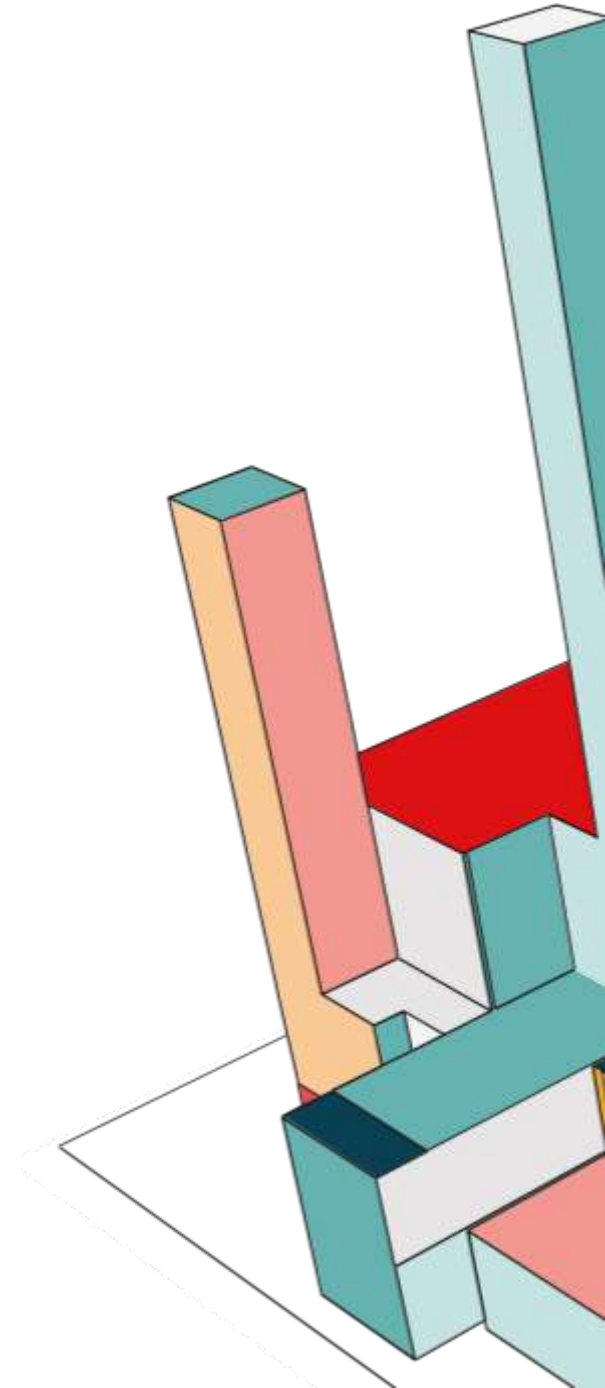
PROJECT OVERVIEW

- **Objective:** Develop a cross-platform app demonstrating CRUD operations using Back4App as the backend.
- **Description:** A Flutter-based application managing daily task as well as maintaining notes and has robust authentication features.



DEMO LINK : [CLICK HERE](#)

- **GitHub Link : [FlutterApp_Github link](#)**



FEATURES BY SCREENS



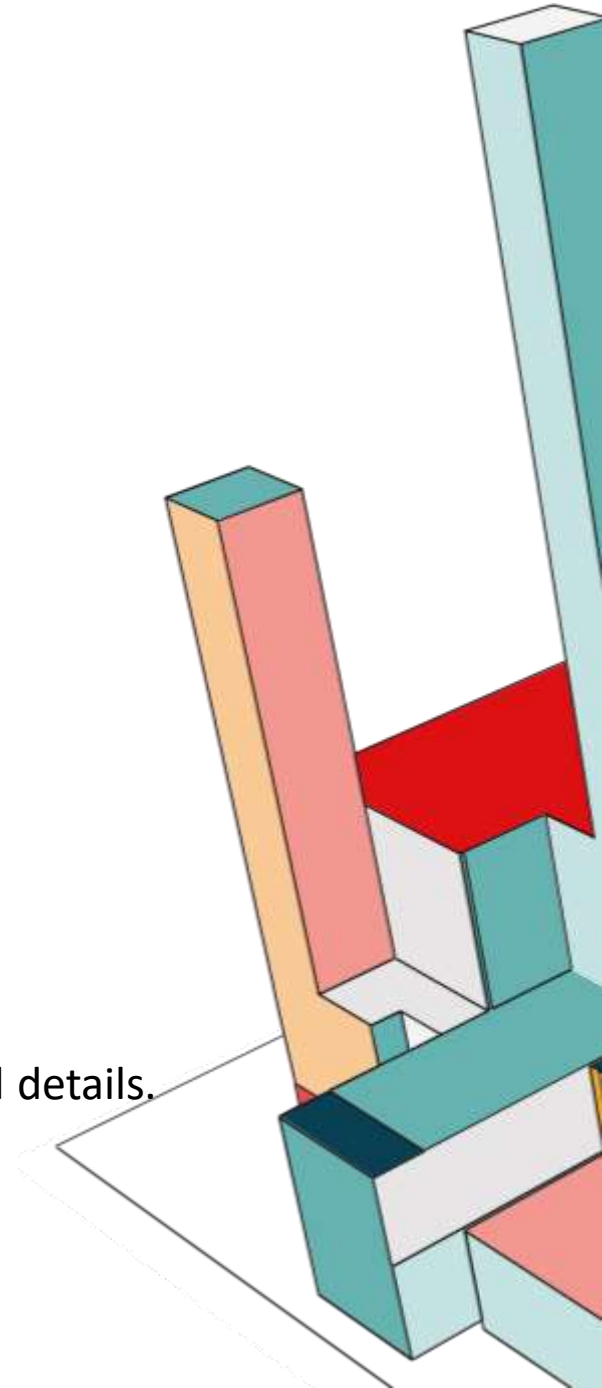
1. Authentication Screens

Login Screen (`lib/screens/login_screen.dart`)

- **Features:**
 - Allows users to log in using their email and password.
 - Validates form inputs (e.g., email format and required fields).
 - Displays error messages for invalid credentials or network issues.
 - Shows a loading indicator during the login process.
 - Redirects to the Employee List Screen upon successful login.
 - Provides navigation to the Signup Screen for new users.

Signup Screen (`lib/screens/signup_screen.dart`)

- **Features:**
 - Allows new users to register by providing email, password, and other required details.
 - Validates form inputs (e.g., email format, password strength).
 - Displays success or error notifications after registration.
 - Redirects users to the Login Screen upon successful signup.



IMPLEMENTATION PERSPECTIVE & SECURITY CONSIDERATIONS

Key Features

- **Authentication:** Login, signup, and session management.
- **Task Management:** Full CRUD functionality with validation.

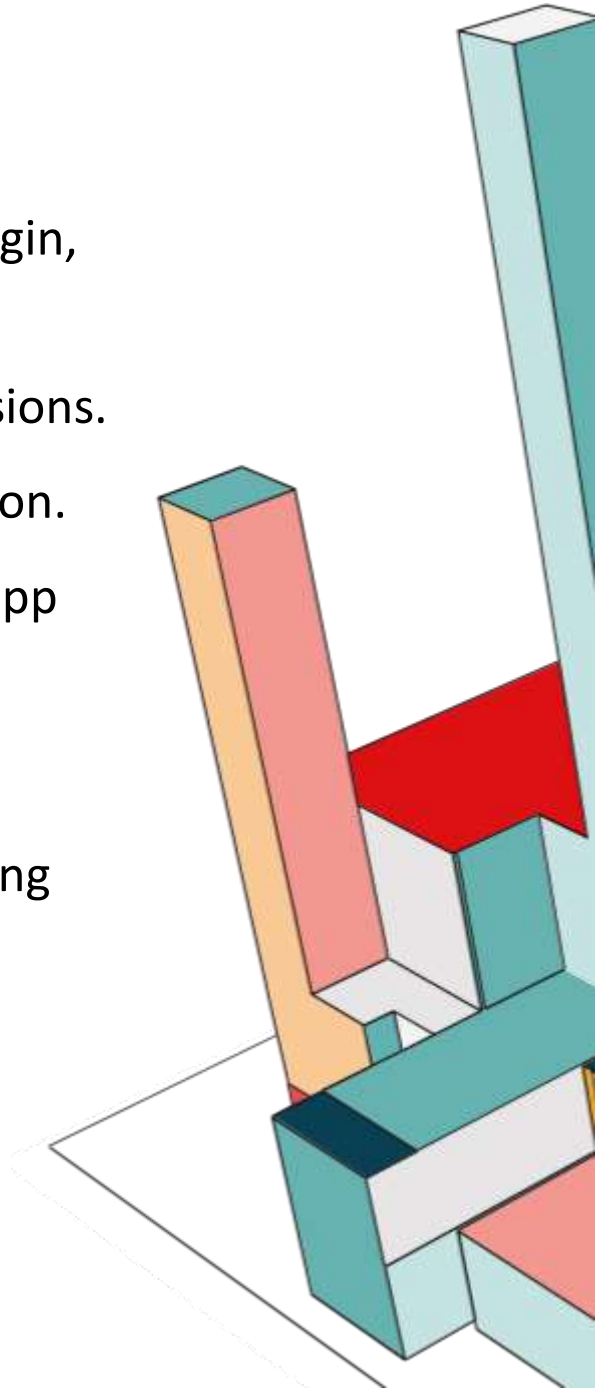


Authentication Implementation

- **User Authentication:** Handled via Back4App's Parse SDK using ParseUser for login, signup, and logout.
- **Session Management:** Validates session tokens and auto-logout on invalid sessions.
- **Security:** Passwords are securely managed by Parse SDK with HTTPS transmission.
- **ACL:** Setting ACL's to prevent security vulnerability by allowing right access to app user with invalid sessions by any mean.

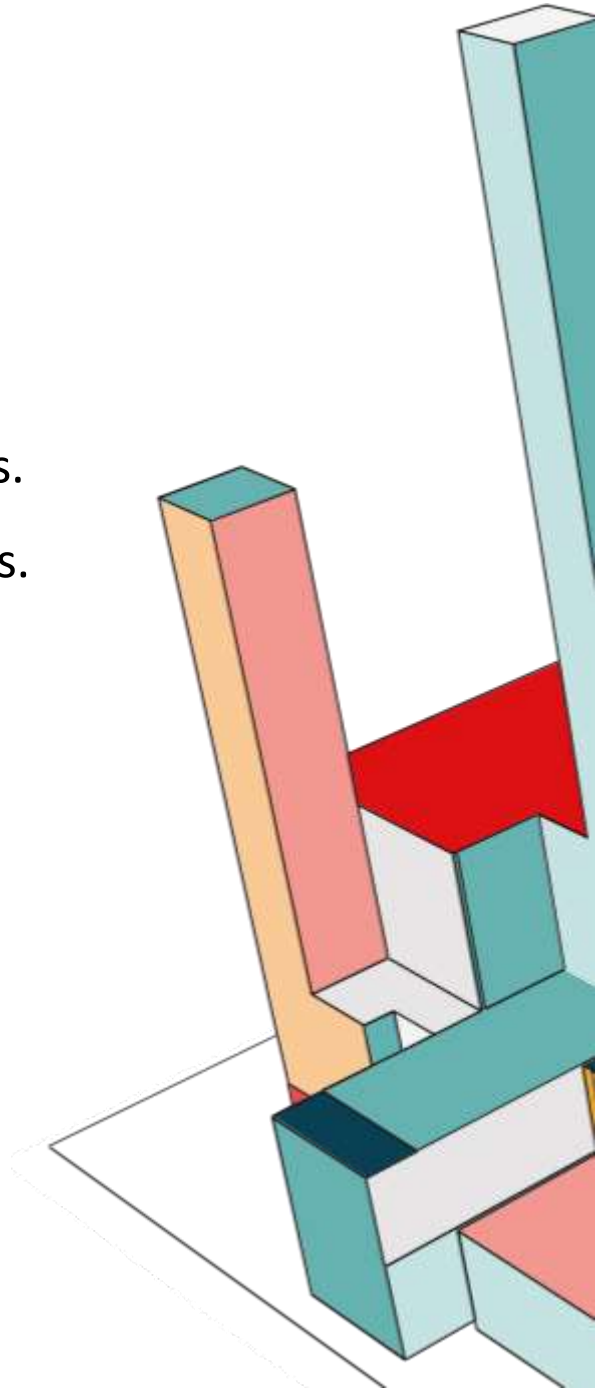
Task and Notes Management

- **CRUD Operations:** Task and notes can be added, edited, deleted, and listed using Back4App's task and notes class.
- **Validation:** Form validation for required fields.



Back4App Models

1. **User Model:** Manages authentication with fields like username, password, and email.
2. **Task Model:** Stores task details (title, description, isdone) for CRUD operations.
3. **Note Model:** Stores Notes details(title, content, category) for CRUD operations.





TECHNOLOGY STACK

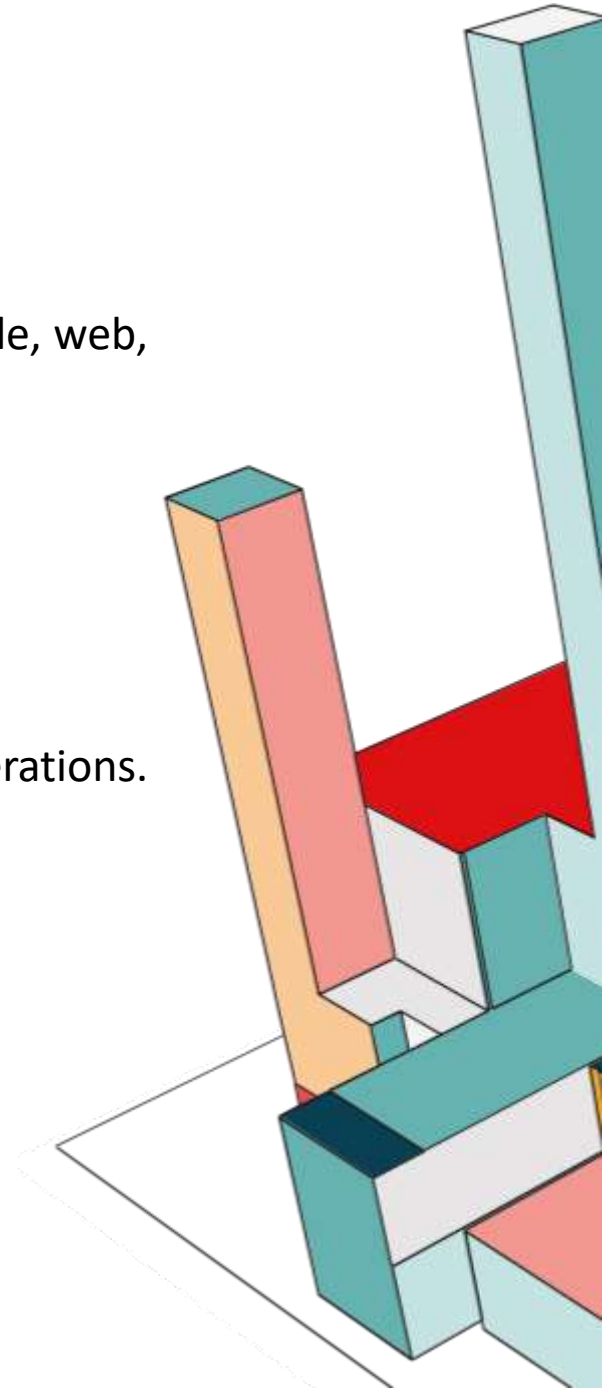
Technology Stack

Frontend

- **Flutter:** A cross-platform UI toolkit for building natively compiled applications for mobile, web, and desktop from a single codebase.
 - **Dart:** The programming language used for Flutter development.

Backend

- **Back4App:** A backend-as-a-service (BaaS) platform built on Parse Server.
 - **Parse SDK:** Used for handling authentication, session management, and CRUD operations.
 - **Parse Server Features:**
 - User authentication and session management.
 - Data storage for employee and notification models.
 - Built-in security features like HTTPS and session token validation.



State Management

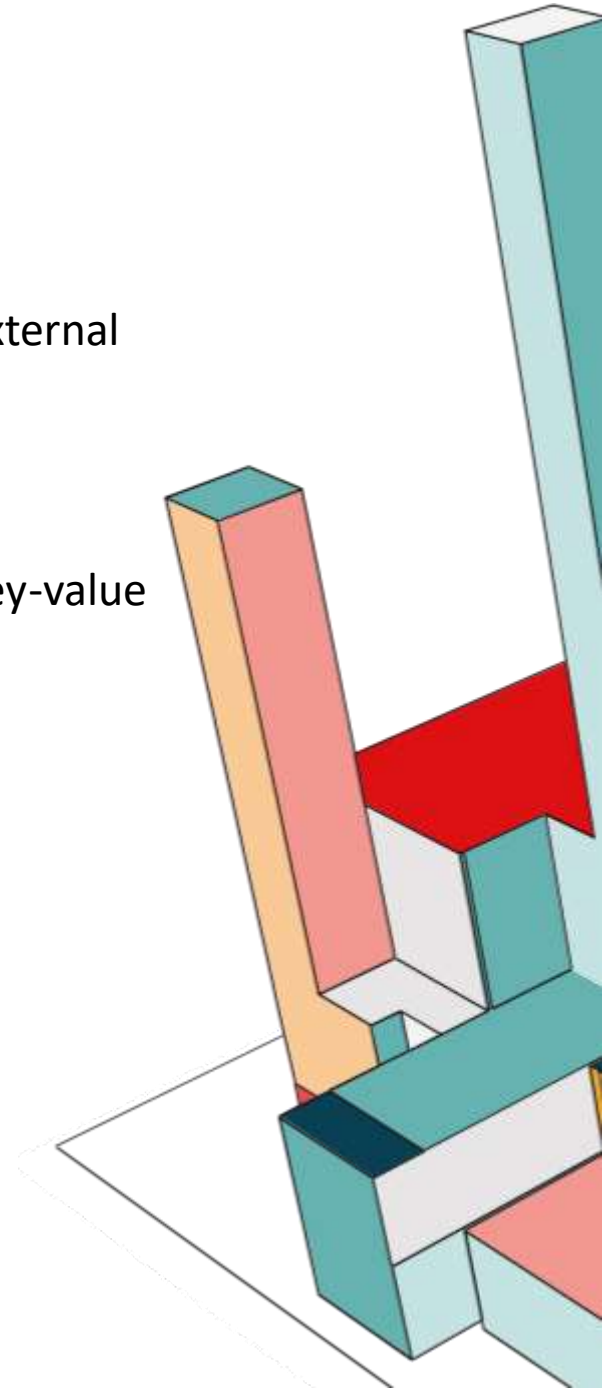
- **Local State Management:** Managed directly within widgets using `setState`. No external state management libraries like `Provider` are used.

Storage

- **SharedPreferences:** Used for local storage of notification data and other small key-value pairs.

Packages and Libraries

1. **`parse_server_sdk_flutter`:** For interacting with Back4App's Parse Server.
2. **`shared_preferences`:** For local data persistence.



Development Tools

- **Visual Studio Code:** Recommended IDE for Flutter development.
- **Flutter CLI:** For building, running, and managing the Flutter project.

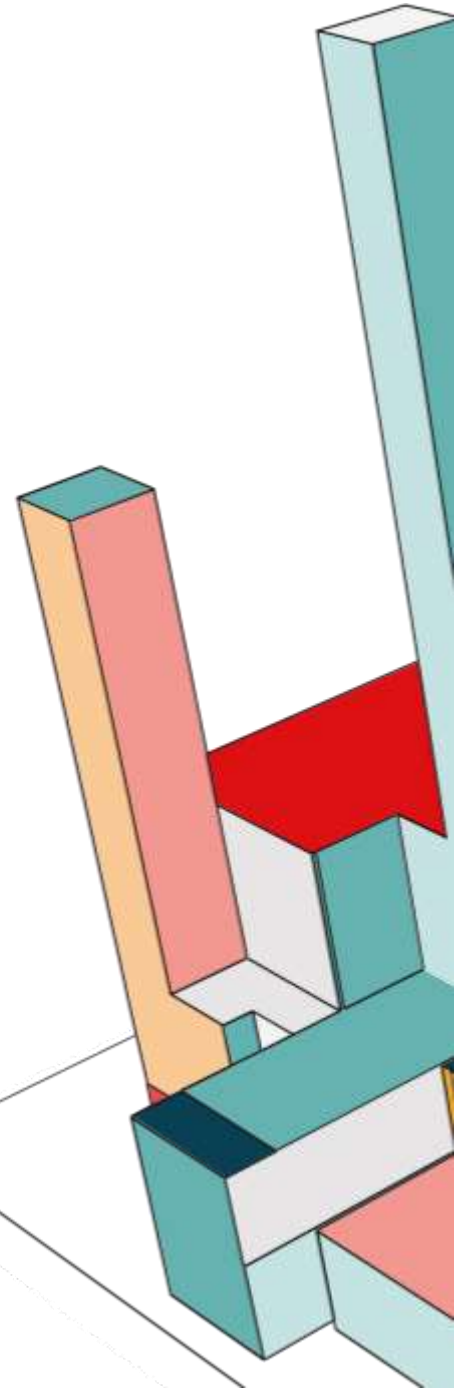
APIs

- **Parse API:** Used for backend communication, including user authentication, employee data management, and notifications.

Security

- **HTTPS:** Ensures secure communication between the app and Back4App.
- **Parse SDK Security:** Handles password hashing, session token management, and secure data transmission.

This stack ensures a robust, scalable, and secure application with minimal backend management, leveraging Back4App's BaaS capabilities.

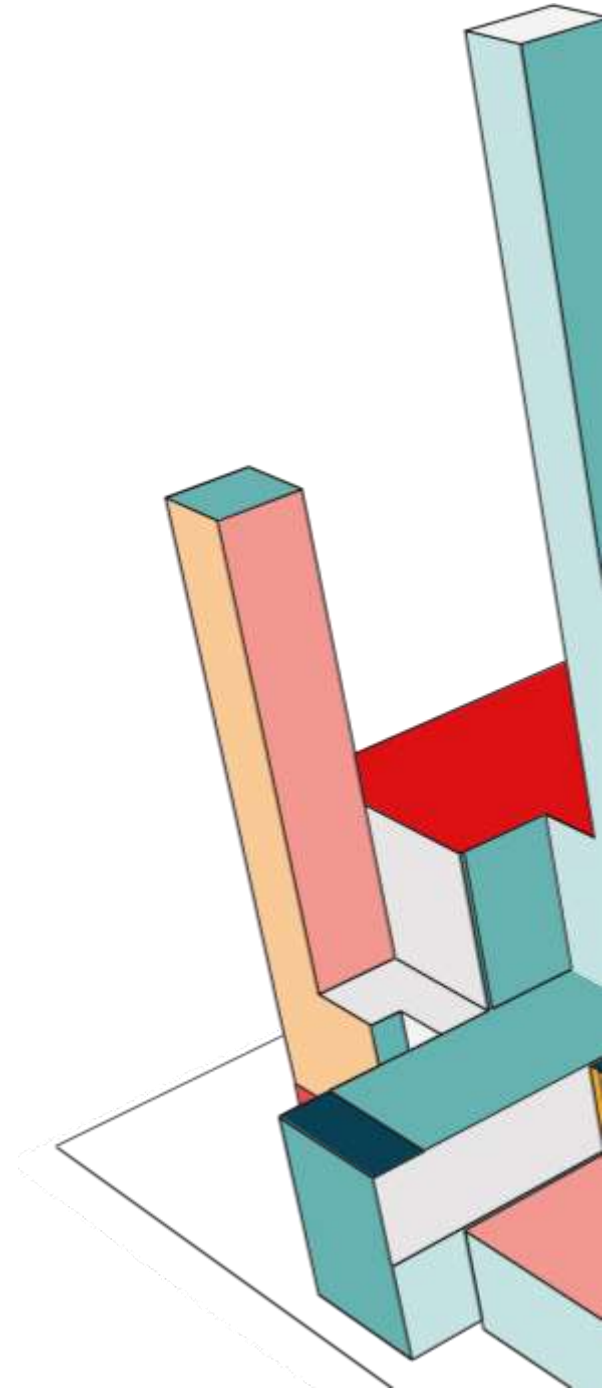




CHALLENGES ENCOUNTERED

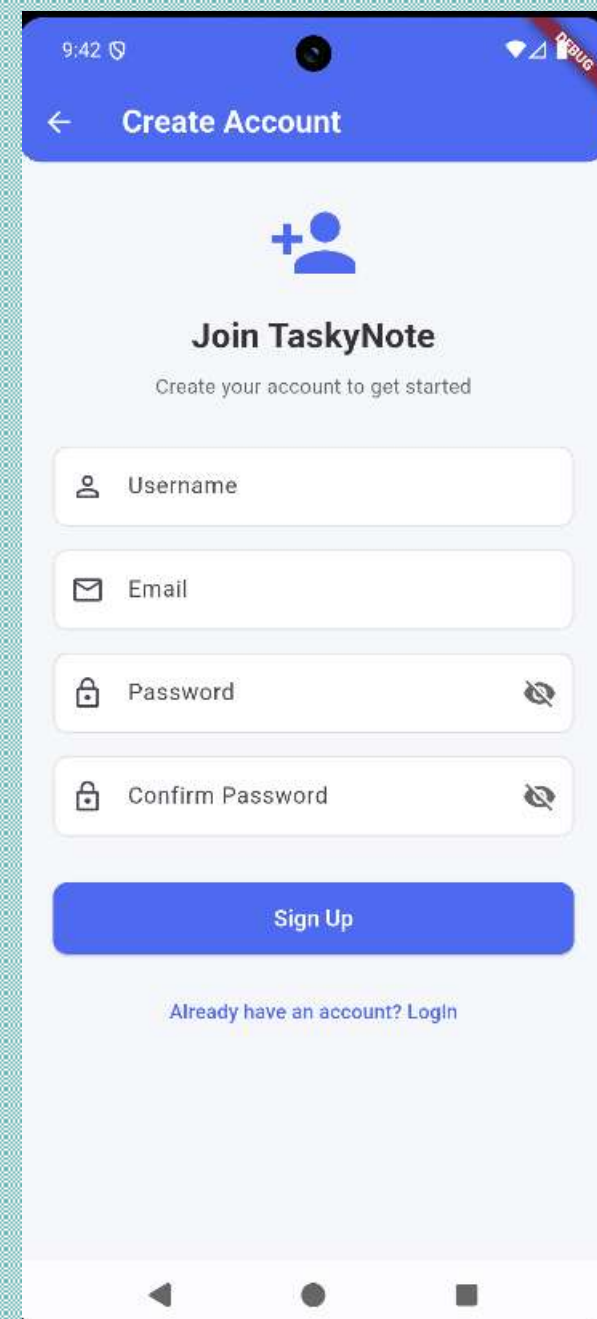
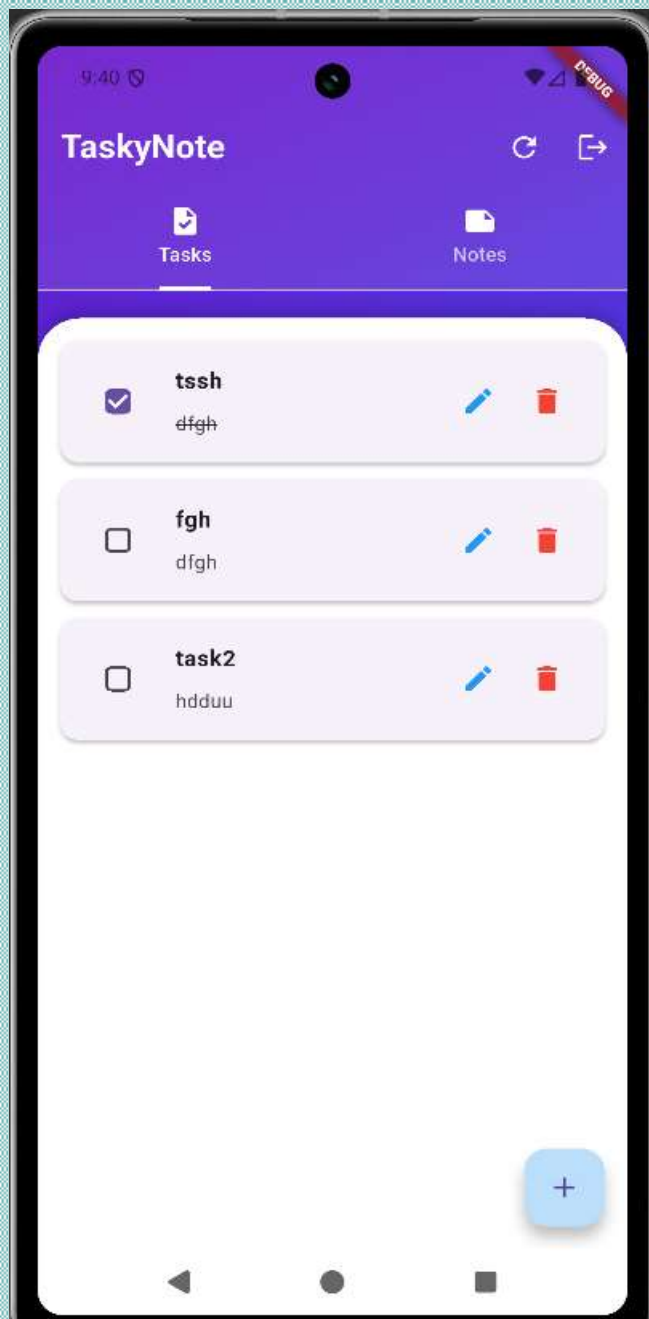
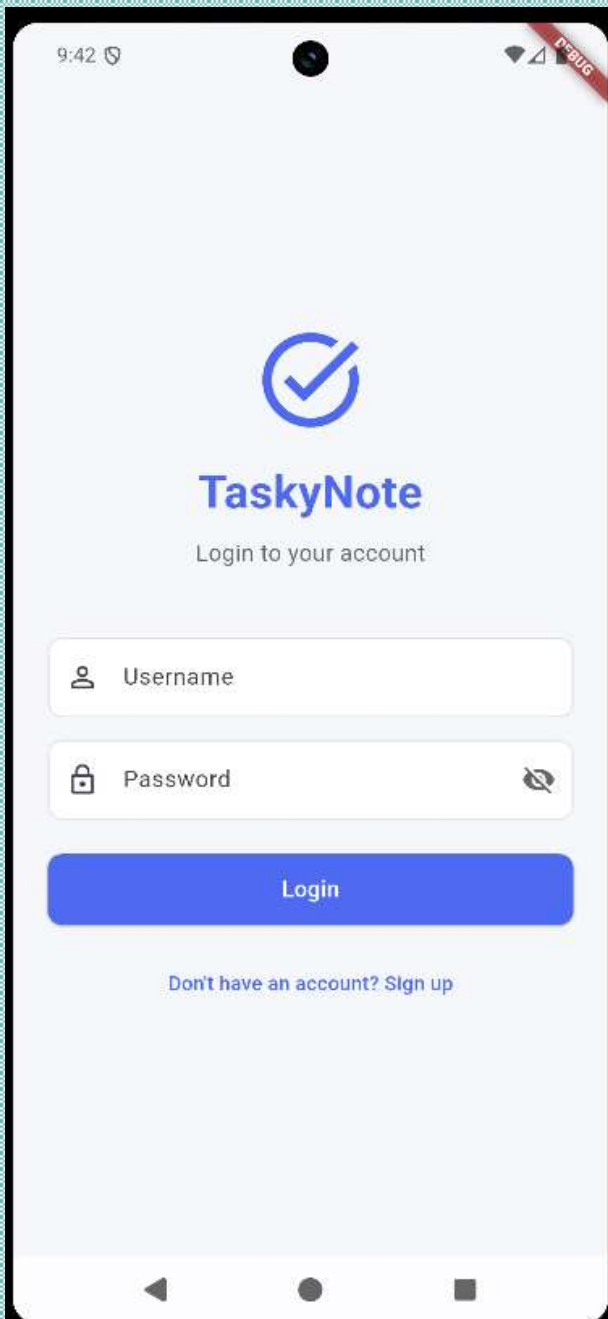
Challenges Encountered

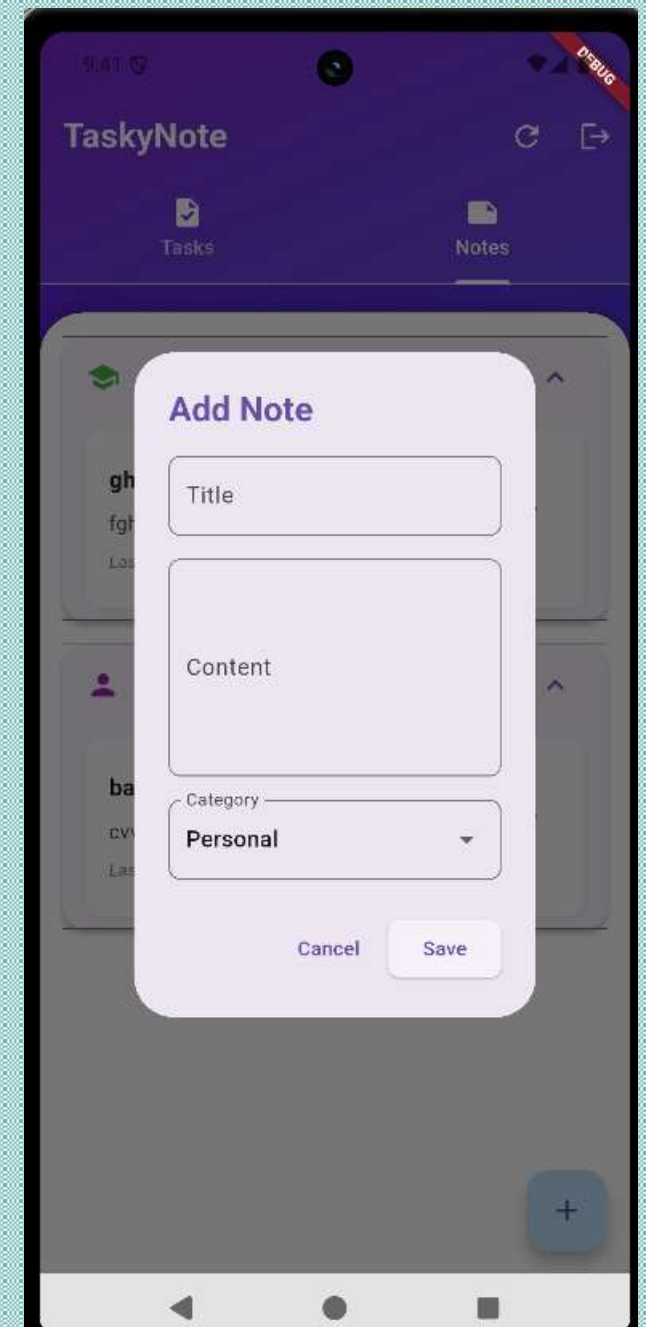
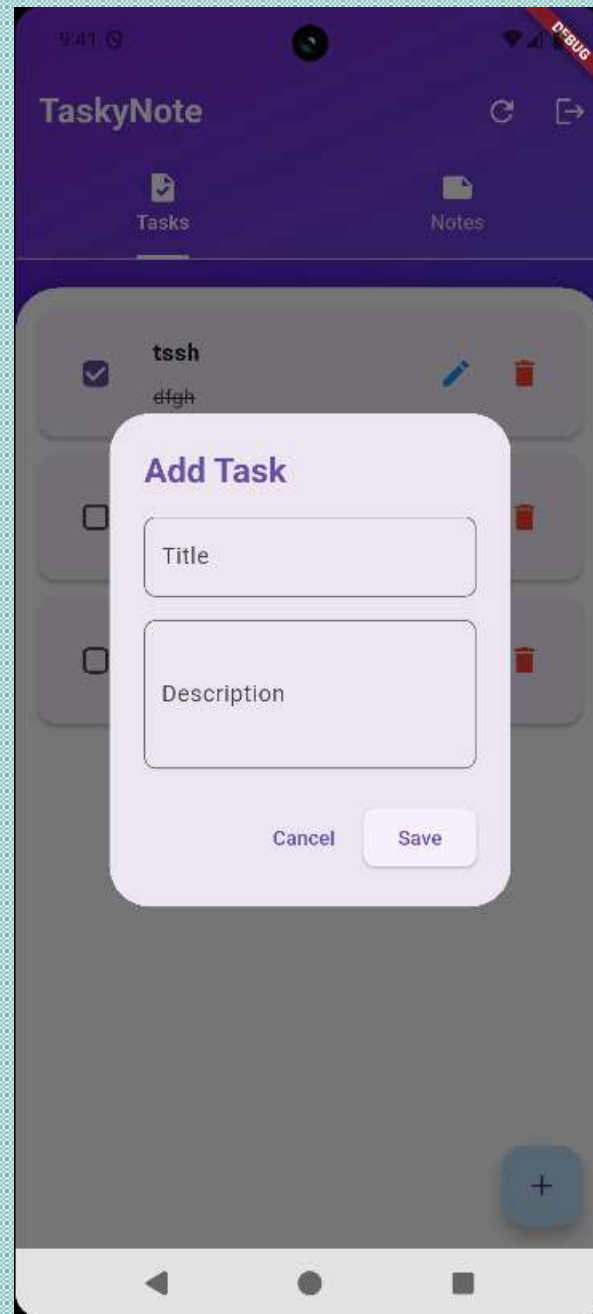
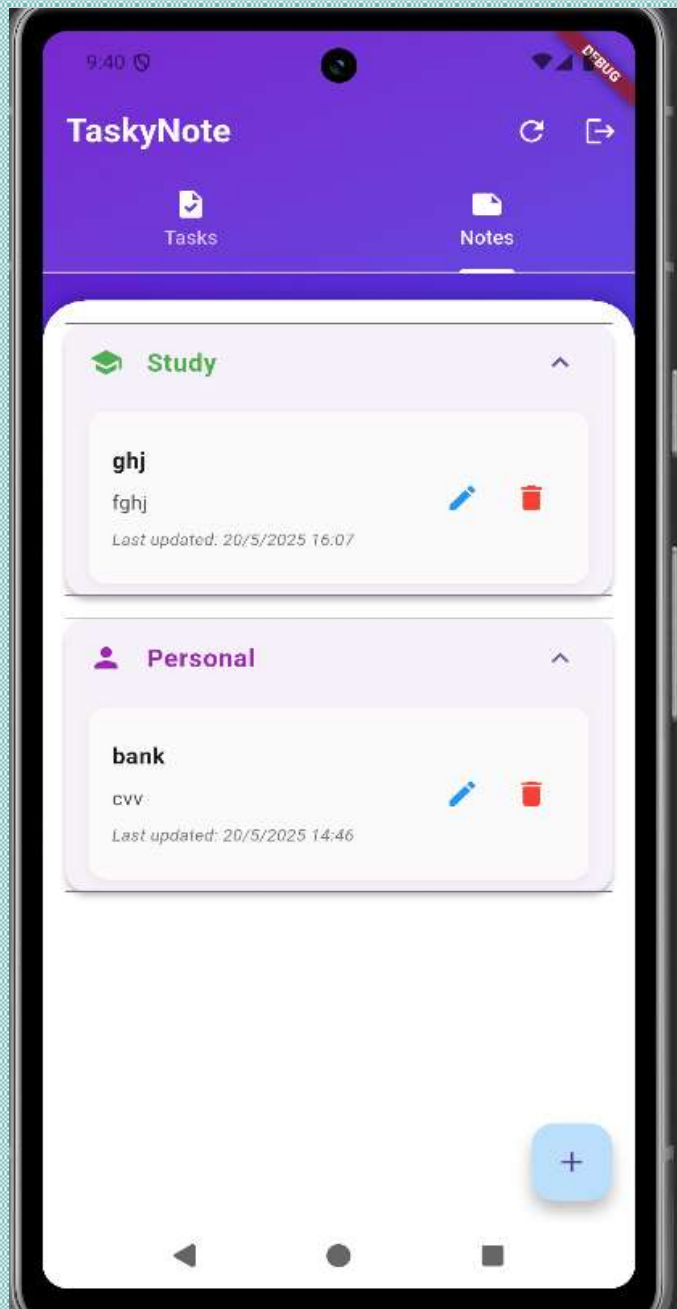
- Ensuring cross-platform UI consistency.
- Styling has a steep learning curve, would be nice if they have followed similar HTML styling standard.



SCREENSHOTS / DEMO







back4app

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What do you want to build today?

My AppsDocsSupport

c

New App

First_App

Overview

Database

Browser

Index Manager

Cloud Code

API

Database

Browser

2 objects

Row

Column

objectId string	emailVerifi... Boolean	ACL ACL	updatedAt Date	authData object *	username string *	createdAt Date	password string *	email String	Add a new column
kNBNGgEnKC	(undefined)	kNBNGgEnKC	18 May 2025 at 16:2...	(undefined)	user2	18 May 2025 at 16:2...	(hidden)	user2@gmail.com	
wXXP2S5e2F	(undefined)	wXXP2S5e2F	17 May 2025 at 16:5...	(undefined)	user1	17 May 2025 at 16:5...	(hidden)	user1@gmail.com	

Browser

Add Class

_Role

0

_Session

1

_User

2

B4aVehicle

1

Note

1

Task

1

Index Manager

back4app

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2 objects

Row

Column

objectId string	createdAt Date	updatedAt Date	ACL ACL	title string	content string	category string	user Pointer <_User>	Add a new column
T7aenhDrq1	20 May 2025 at 16:0...	20 May 2025 at 16:0...	Public Read + Write	ghj	fghj	Study	wXXP2S5e2F	
pdxuGq9DPm	20 May 2025 at 14:4...	20 May 2025 at 14:4...	Public Read + Write	bank	cvv	Personal	wXXP2S5e2F	

Browser

Add Class

_Role

0

_Session

1

_User

2

Note

2

Task

3

Index Manager

back4app

What do you want to build today?

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Overview

Database

Browser

_Role0

_Session1

_User2

Database Browser

Task3 objects

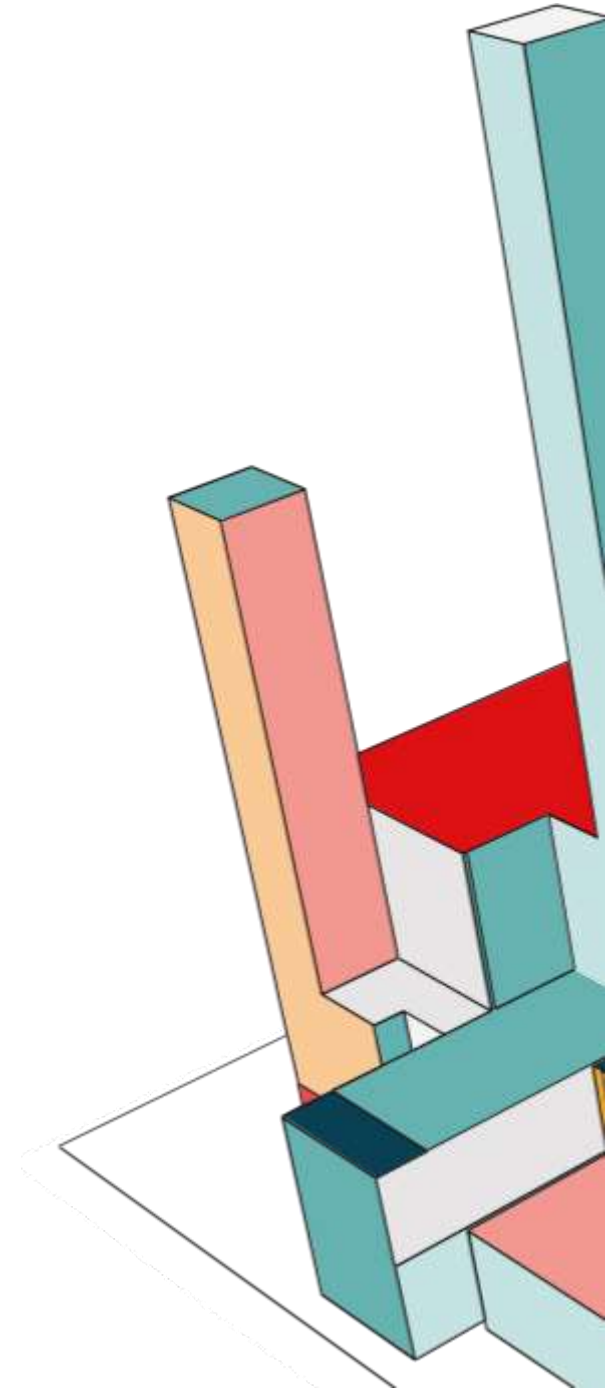
RowColumn

	objectId String	updatedAt Date	createdAt Date	ACL ACL	title String*	description String	isDone Boolean	user Pointer <_User>	Add a new column
	40EVB01UQx	20 May 2025 at 16:0...	20 May 2025 at 16:0...	Public Read + Write	fgh	dfgh	False	wXXP2S5e2F	
	30oTjkI7Cu	20 May 2025 at 16:0...	20 May 2025 at 16:0...	Public Read + Write	tssh	dfgh	False	wXXP2S5e2F	
	nGxwzFOkHG	20 May 2025 at 14:5...	20 May 2025 at 14:5...	Public Read + Write	task2	hdduu	False	wXXP2S5e2F	

LEARNING OUTCOME S



- Gained experience with Flutter's widget tree and state management.
- Learned to integrate backend services with Parse Server.
- Improved skills in designing responsive and adaptive UI.
- Leant low-code development with back4app framework



THANK YOU

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