PROJECT ARTEFACT DECLARATION

SEM 1 2023/2024 I BITP 3453 MOBILE APPLICATION DEVELOPMENT

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DESCRIPTION OF THE PROJECT

INTRODUCTION:

Education is a cornerstone of societal progress, and the integration of technology into learning environments has become imperative in today's dynamic world. The "My School" mobile application, developed using Flutter for the Android platform, represents a comprehensive solution to enhance the quality and accessibility of education. The app adheres to the United Nations Sustainable Development Goal (SDG) of "Quality Education," addressing challenges through the implementation of a robust structure comprising presentation, business, and data layers. Firebase serves as the backend infrastructure, ensuring seamless data management and communication.

PROBLEM STATEMENTS:

- Communication Gap: Institutions struggle to communicate effectively with students, leading to delays in sharing crucial information.

- Inefficient Academic Processes: Manual tracking of attendance, results, leave applications, and assignments results in errors and delays.

- Complex User Interfaces: Existing systems lack a user-friendly interface, hindering effective usage by diverse users.

- Lack of SDG Alignment: Some systems don't align with the UN SDG for "Quality Education," impacting their contribution to global educational improvement.

OBJECTIVES:

- Enhanced Communication: Facilitate seamless communication between students and educational institutions, ensuring timely sharing of information, announcements, and updates.

- Academic Management: Provide a comprehensive solution for academic-related activities, including attendance tracking, result management, leave applications, and assignment submissions.

- User-Friendly Interface: Develop an intuitive and user-friendly interface that caters to diverse users.

- Contribution to SDG: Align the application's objectives with the United Nations SDG of "Quality Education" to contribute to the global initiative of improving educational outcomes.

SCOPES:

- **Authentication and Authorization:**
  Secure login and registration mechanisms for students, parents, and educators, ensuring data privacy and security.

- **Profile Management:**
  Personalized profiles for each user type, allowing them to view and update their information.

- **Academic Features:**
  Attendance Tracking: Real-time monitoring of student attendance for both parents and educators.

- **Result Management:**
  Access to academic results, grading, and performance analysis.

- **Leave Application:**
  Streamlined process for students to apply for leaves with automated notifications to parents and educators.

- **Assignment Submission:**
  A dedicated space for students to submit assignments and receive feedback.

- **Date Sheet Display:**
  A centralized display of date sheets, ensuring easy access to exam schedules and important dates.

TARGET USERS:

- **Students:**
  Access academic information, track attendance, submit assignments, and apply for leaves.

- **Educators:**
  Manage attendance records, submit and evaluate assignments, and communicate with students.

ARCHITECTURE:

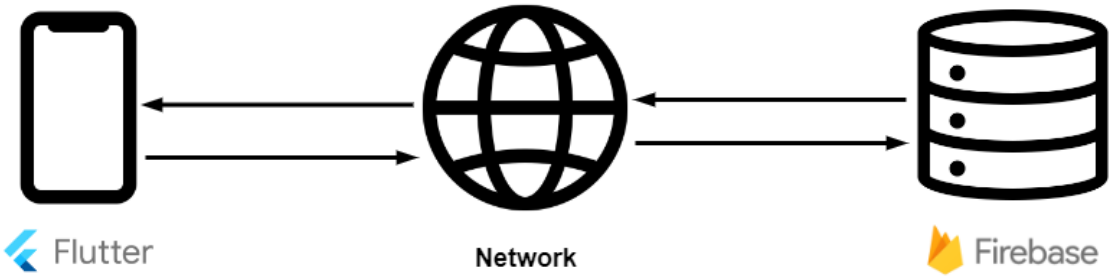


Figure 1: Multi-layered architecture

Table 1: Multi-layered architecture definition

Layer	Description
Presentation Layer	Manages the user interface and user experience components, providing a seamless interaction for all stakeholders – students and educators.
Business Layer	Encompasses the logic and functionalities that drive the application, overseeing processes like attendance tracking, result management, and communication within the "My School" app.
Data Layer	Utilizes Firebase as the backend infrastructure to securely store, retrieve, and manage data, ensuring efficient data handling for various aspects of the application.

FIREBASE DATABASE:

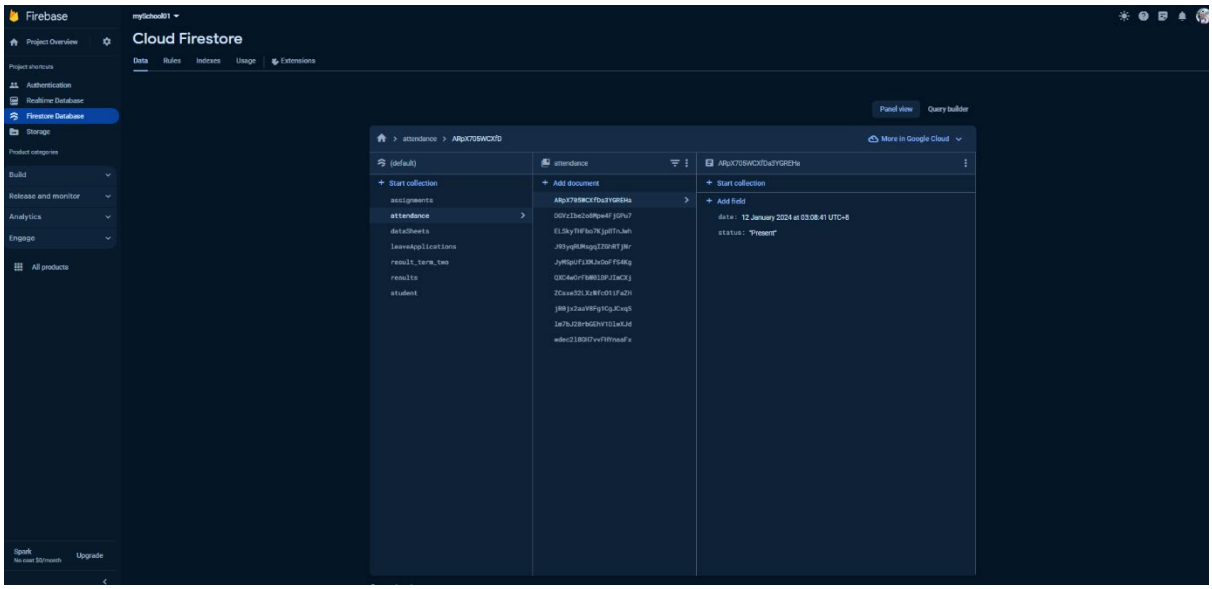


Figure 2: Firebase collection Names

Table 2: Definition of collections

Collection Name	Description
assignments	Collection for storing information related to assignments
attendance	Collection for tracking student attendance
dataSheets	Collection containing data sheets for academic schedules
leaveApplications	Collection for managing student leave applications
result_term_two	Collection for storing academic results for term two
results	Collection for general academic results
student	Collection containing information about students

CONCLUSION:

The "My School" mobile application aspires to redefine the educational experience by addressing prevalent challenges and leveraging technology for positive change. By aligning with the SDG of "Quality Education," the app positions itself as a tool that goes beyond conventional academic platforms, fostering collaboration, transparency, and efficiency in educational processes. Through enhanced communication, academic management, and user-friendly interfaces, the "My School" app strives to be a catalyst for positive transformations in the educational landscape, contributing to the broader global goal of ensuring quality education for all.

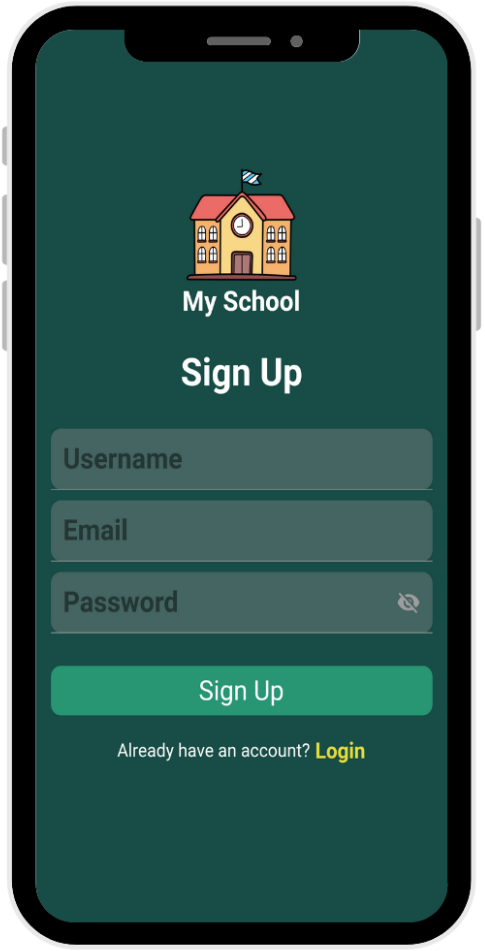
The "My School" app demonstration is accessible on YouTube via this link

https://youtu.be/sUaSTcqcB6E

THE APPLICATION FIRST SCREEN

File name: splash_screen.dart

THE OTHER SCREEN 1



File name: sign_up_page.dart

Class: SignUpPage

- Represents the app's sign-up screen.
- Implements Firebase for user registration.
- Includes input fields for username, email, and password, a sign-up button, and a login link.
- Displays "My School" logo and a background image.

Method: _signUp

- Handles user registration.
- Initiates sign-up with username, email, and password.
- Shows loading indicator during the process.
- Navigates to the home screen on successful registration.

Widgets and Libraries Used:

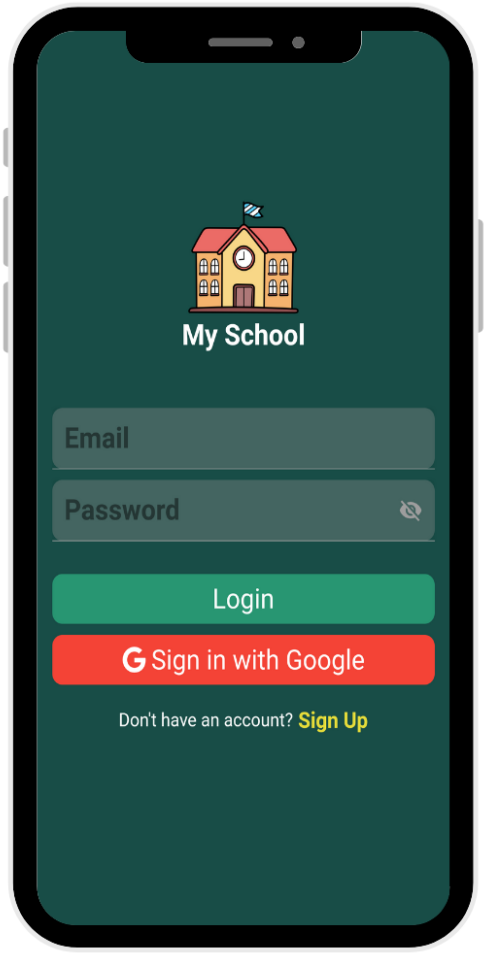
- **FirebaseAuth and FirebaseAuthServices:** Firebase authentication.
- **FormContainerWidget:** Custom text input fields.
- **Toast:** Displays short-lived messages.
- Other Flutter widgets for UI components.

UI Components:

- "My School" logo and background image.
- Text elements for titles and labels.
- Text input fields for username, email, and password.
- Sign-up button with loading indicator.
- Login link.

Navigation:

- Navigates to the login page **(LoginPage)** on tapping the login link.
- Navigates to the home screen **("/home")** after successful registration.



File name: login_page.dart

Class: LoginPage

- Represents the login screen.
- Implements Firebase authentication for email/password and Google sign-in.
- Includes email/password input fields, login & Google sign-in buttons, and a sign-up link.
- Displays "My School" logo and a background image.

Methods:

- _signIn
- Handles email/password authentication.
- Initiates sign-in and navigates to the home screen on success.
- Displays a loading indicator during the process.
- _signInWithGoogle
- Manages Google sign-in using Firebase.
- Navigates to the home screen on success.
- Displays an error message if an issue occurs.

Widgets and Libraries Used:

- **FirebaseAuth and FirebaseAuthServices:** Firebase authentication.
- **GoogleSignIn and GoogleAuthProvider:** Google sign-in.
- **FlutterSizer:** Responsive design.
- Other Flutter widgets for UI components (e.g., Scaffold, Column, TextField, Container, GestureDetector, Text, Image, CircularProgressIndicator).

File name: signOut.dart

Class: SignOut

- Represents the sign-out button in the application.
- Utilizes Firebase to sign the user out.
- Displays a button with a logout icon and the text "Sign Out."

Method: _signOut

- Handles the sign-out process.
- Invokes Firebase's signOut method.
- Navigates to the login page (LoginPage) on successful sign-out.
- Handles errors during the sign-out process.

Widgets and Libraries Used:

- **FirebaseAuth:** Firebase authentication.
- **FlutterSvg:** Package for working with SVG images in Flutter.
- Flutter widgets for UI components (Container, ElevatedButton, Column, SvgPicture, SizedBox, Text).

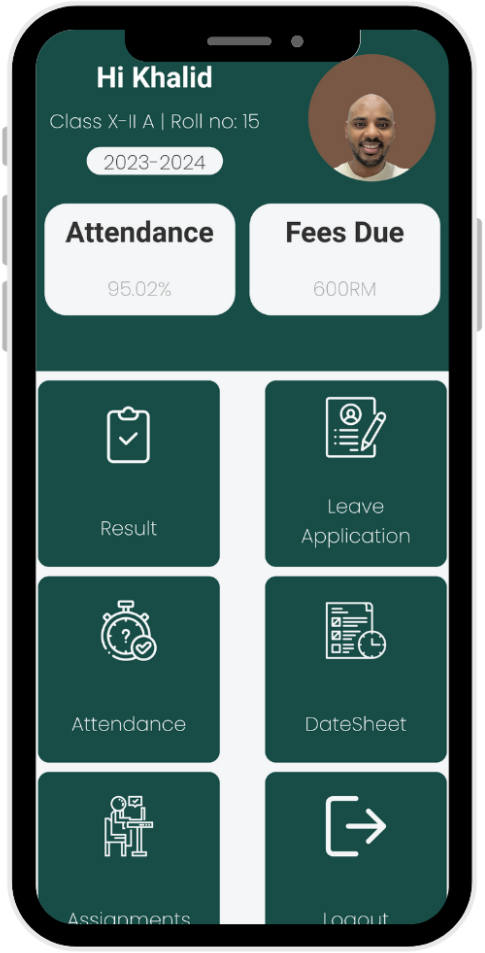
UI Components:

- ElevatedButton with a white background.
- SVG logout icon colored in teal.
- Text displaying "Sign Out" with teal color.

Navigation:

- Navigates to the login page (LoginPage) after successful sign-out.

THE OTHER SCREEN 2



File name: home_screen.dart

Class: HomeScreen

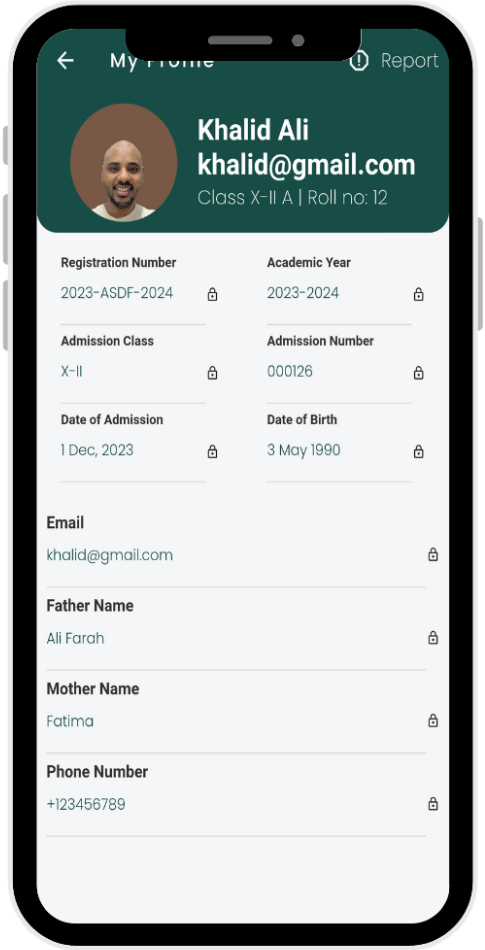
- Represents the main screen of the application.
- Displays user information, statistics, and navigation cards for various features.

Widgets and Libraries Used:

- **FirebaseAuth:** Firebase authentication.
- **FlutterSvg:** Package for working with SVG images in Flutter.
- **Sizer:** Library for responsive design.
- **Flutter widgets for UI components** (Scaffold, Column, Container, Row, Expanded, InkWell, SvgPicture, Text, SingleChildScrollView).

UI Components:

- **Top Half:**
  User information and picture.
  Attendance and fee due data.
- **Bottom Half:**
  Navigation cards for features like Result, Leave Application, Attendance, DateSheet, Assignments, and Logout.
  Cards are clickable and lead to respective feature screens.
- **Navigation:**
  Navigates to various feature screens on card tap (e.g., Result, Leave Application, Attendance, DateSheet, Assignments, Logout).



File name: my_profile.dart

Class: MyProfileScreen

- Represents the user profile screen displaying personal and academic details.
- Allows reporting issues with the profile to school management.

Widgets and Libraries Used:

- **FirebaseAuth:** Firebase authentication.
- Sizer: Library for responsive design.
- Flutter widgets for UI components (Scaffold, AppBar, Container, Column, Row, CircleAvatar, Text, ProfileDetailRow, ProfileDetailColumn).

UI Components:

- **AppBar:**
- **Title:** "My Profile"
- **Action:** "Report" button for reporting profile issues.

User Information:

- Profile picture, name, email, class, and roll number.

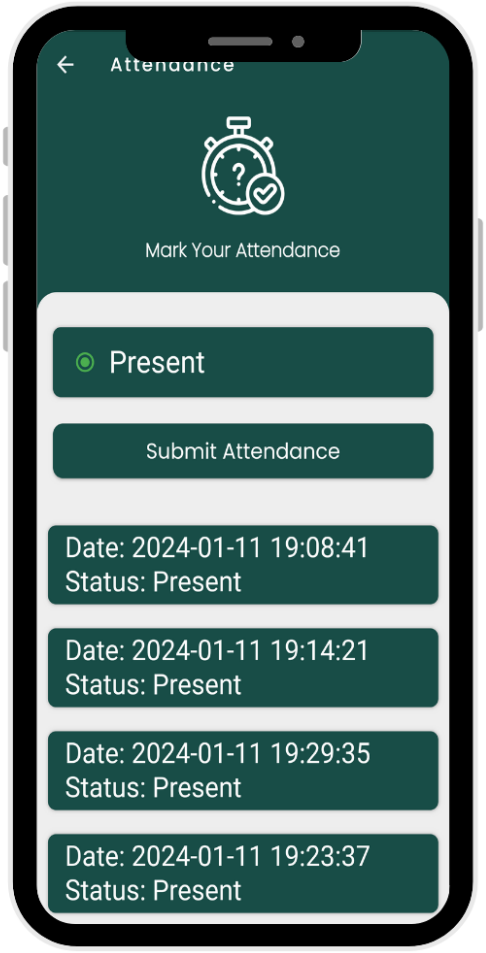
Details Rows:

- Rows displaying registration number, academic year, admission class, admission number, date of admission, and date of birth.

Details Columns:

- Columns displaying email, father name, mother name, and phone number.

THE OTHER SCREEN N



File name: mattendanceScreen.dart

Class: AttendanceScreen

- Represents the attendance screen allowing users to mark their attendance and displaying attendance records.
- Utilizes Firestore for storing and retrieving attendance data.

Widgets and Libraries Used:

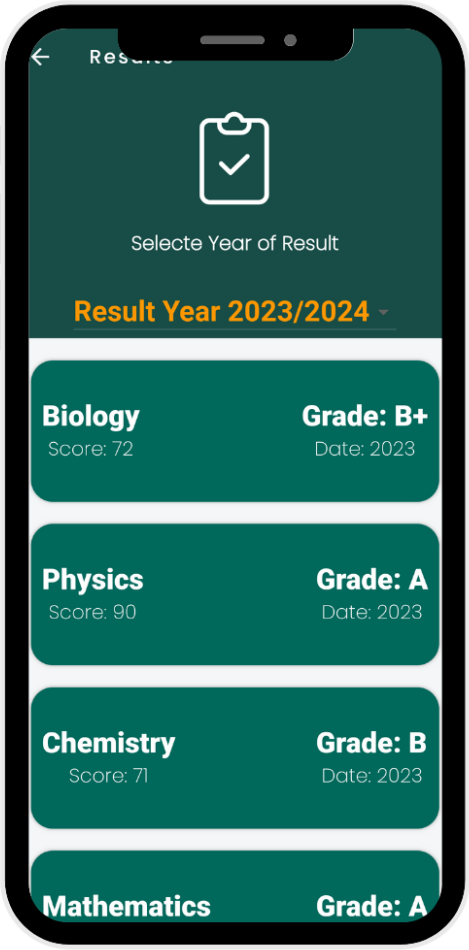
- **Firestore:** Cloud Firestore for storing attendance data.
- **FlutterSvg:** Package for working with SVG images in Flutter.
- **Sizer:** Library for responsive design.
- **StreamBuilder:** Widget for listening to changes in Firestore data in real-time.
- **Flutter widgets for UI components** (Scaffold, AppBar, Container, Column, Text, SizedBox, Radio, ElevatedButton, StreamBuilder, ListView.builder, ListTile, SnackBar).

UI Components:

- **Top Section:**
- **SVG icon for attendance**.
- **Title:** "Mark Your Attendance".
- **Middle Section:**Form for users to input attendance status (Present/Absent).
- Submit button to record attendance.
- **Bottom Section:**
- Display attendance data using StreamBuilder to listen to Firestore changes.
- Each attendance entry shows the date and status.

Attendance Submission:

- Users can submit their attendance status (Present/Absent).
- Records the date and time of submission in Firestore.



File name: result_screen.dart

Class: ResultScreen

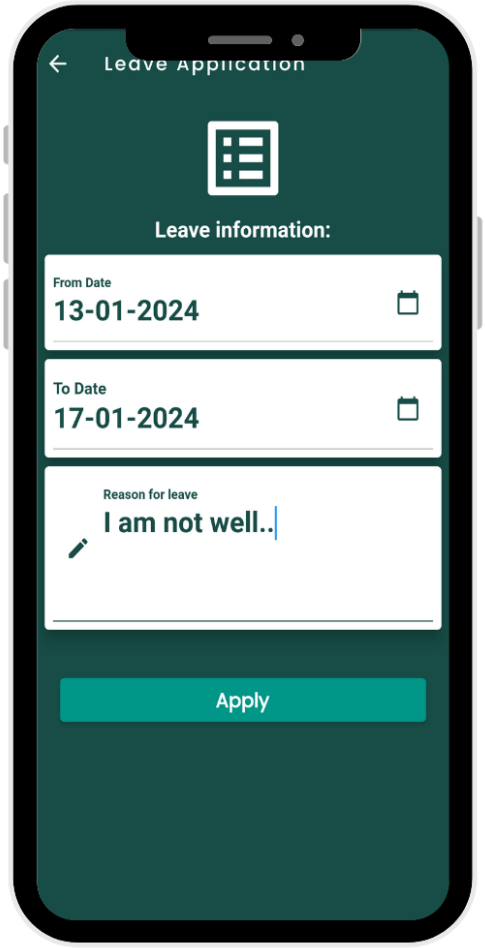
- Represents the result screen displaying student results from selected years.
- Uses Firestore for fetching and displaying result data.

Widgets and Libraries Used:

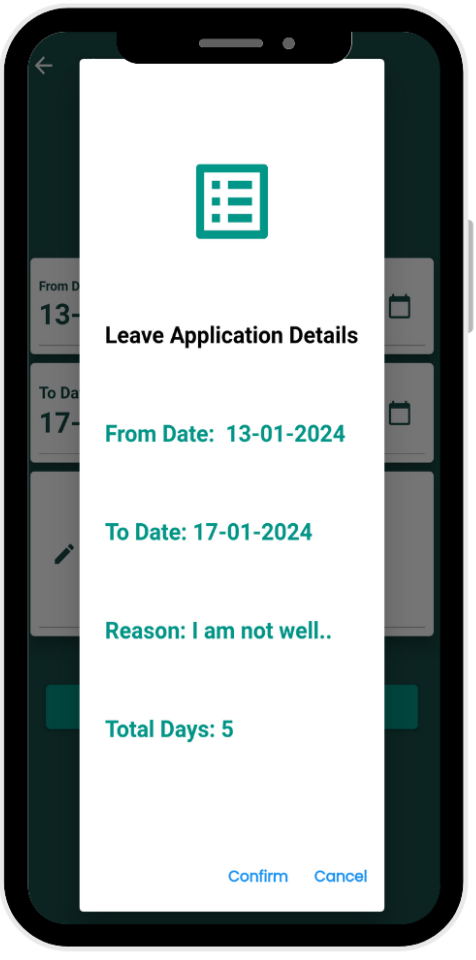
- **FlutterSvg:**
- Package for working with SVG images in Flutter.
- Sizer: Library for responsive design.
- **Firestore:** Cloud Firestore for storing and retrieving result data.
- Flutter widgets for UI components (Scaffold, AppBar, Container, Column, Text, SizedBox, DropdownButton, StreamBuilder, ListView.builder).

UI Components:

- **Top Section:**
- SVG icon for result.
- Title: "Select Year of Result".
- **Dropdown Button:**
- Allows users to select between different result years.
- **Result Display Section:**
- Displays student result data based on the selected year.
- Each result entry shows subject name, score, grade, and date.
- **Result Selection:**
- Users can choose between different result years using the dropdown button.
- Result data is fetched from Firestore and displayed using StreamBuilder.



leave_application_screen.dart



Class: LeaveApplicationScreen

- Represents the leave application screen where users can apply for leave.
- Utilizes Firebase Authentication for user information and Firestore for storing leave application data.

Widgets and Libraries Used:

- **FirebaseAuth:** Firebase Authentication for managing user authentication.
- Firestore: Cloud Firestore for storing and retrieving leave application data.
- DateFormat: Utility class for formatting and parsing dates.
- Flutter widgets for UI components (Scaffold, AppBar, Container, Column, Text, SizedBox, Card, TextFormField, Divider, ElevatedButton, AlertDialog, Icon, showDatePicker, showDialog, TextButton, SnackBar).

UI Components:

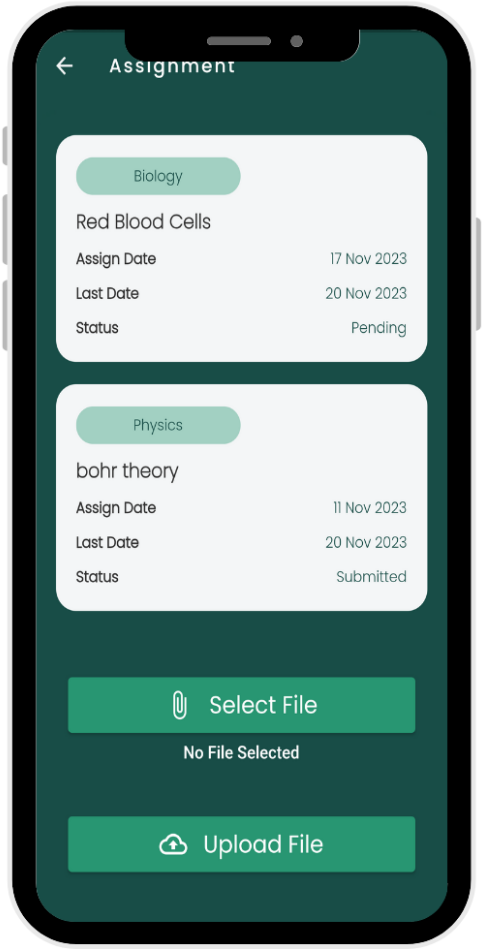
- **Top Section:**
- Icon representing the leave application.
- Title: "Leave Application".
- **Leave Information Section:**
- Form with input fields for "From Date," "To Date," and "Reason for Leave."
- Date fields include calendar icons for date selection.
- Validators ensure that all required fields are filled.
- Submit Button:
- Elevated button for submitting the leave application.
- Validates the form and shows a confirmation dialog before submitting.

Confirmation Dialog:

- Dialog displaying leave application details for confirmation.
- Allows users to confirm or cancel the leave application.

Leave Application Submission:

- Calculates the total number of leave days based on the selected "From Date" and "To Date."
- Displays a confirmation dialog with leave application details for user confirmation.
- Submits the leave application to Firestore upon user confirmation.



File name: assignment_screen.dart

Class: AssignmentScreen

- Represents the assignment screen where users can view and upload assignments.
- Utilizes Firebase Cloud Storage for uploading and retrieving assignment files.
- Implements the FilePicker package for selecting files.

Widgets and Libraries Used:

- FilePicker: A Flutter package for picking files.
- FirebaseStorage: Firebase Cloud Storage for handling file uploads.
- Flutter widgets for UI components (Scaffold, AppBar, Column, Container, SizedBox, Text, ButtonWidget, FilePicker, StreamBuilder).

UI Components:

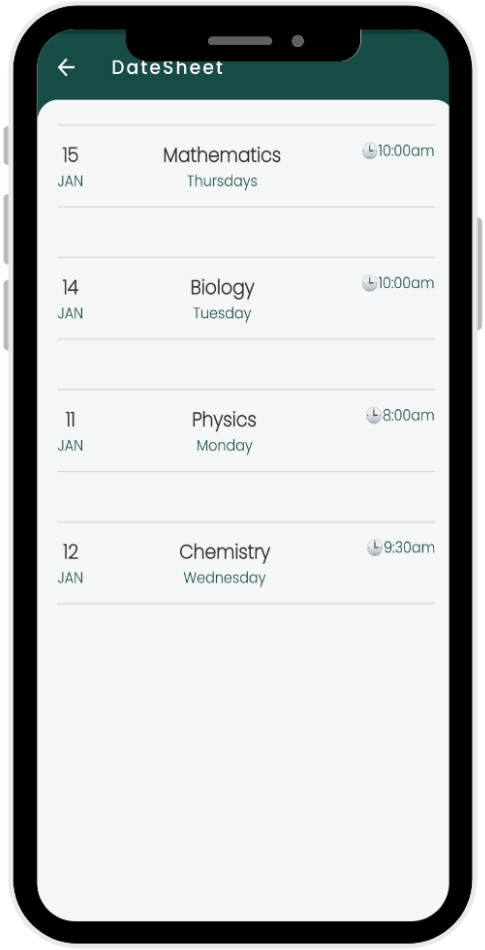
- **Top Section:**
- AppBar with the title "Assignment."
- Assignment Display Section:
- Displays the Assignment widget, showing assignment details.
- File Selection and Upload Section:
- Button to select a file.
- Displays the selected file name.
- Button to upload the selected file.

Upload Status Section:

- Displays the upload status with a progress percentage.

File Selection and Upload:

- Users can select a file using the "Select File" button, which uses the FilePicker package.
- The selected file name is displayed below the button.
- Clicking the "Upload File" button initiates the file upload process to Firebase Cloud Storage.
- The upload status is displayed, showing the progress percentage.
- Firebase Cloud Storage Integration:
- Utilizes Firebase Cloud Storage for storing assignment files.
- The FirebaseApi class handles the file upload process.



File name: datesheet_screen.dart

Class: DateSheetScreen

- Represents the DateSheet screen where users can view date-related information.
- Utilizes Cloud Firestore for retrieving and displaying date-related data.
- Utilizes StreamBuilder for real-time updates from the Cloud Firestore.

Widgets and Libraries Used:

- StreamBuilder: Flutter widget that rebuilds when the given stream emits data.
- **Cloud Firestore:** Firestore database for storing and retrieving data.
- Flutter widgets for UI components (Scaffold, AppBar, Container, ListView.builder, StreamBuilder, Column, Row, Text, Divider, CircularProgressIndicator).

UI Components:

- **Top Section:**
- AppBar with the title "DateSheet."
- **DateSheet Display Section:**
- Utilizes StreamBuilder to listen for changes in the 'dataSheets' collection of Firestore.
- Displays a list of date-related information using ListView.builder.
- **List Item:**
- Each date-related entry is displayed as a container with three columns.
- 1st column: Date and month information.
- 2nd column: Subject name and day information.
- 3rd column: Time information.
- Dividers separate each entry for better visualization.

Cloud Firestore Integration:

- Utilizes Cloud Firestore to fetch data from the 'dataSheets' collection.
- StreamBuilder listens for changes in the Firestore collection, providing real-time updates to the UI.

REFERENCES:

Firebase Documentation/ Add Firebase to your Flutter app:

https://firebase.google.com/docs/flutter/setup?platform=ios

Flutter API reference documentation:

https://api.flutter.dev/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QUALITY
EDUCATION
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