Aim: To design Flutter UI by including common widgets.

Theory:Widgets are the building blocks of a Flutter application. In Flutter, everything is a widget, from simple elements like text and images to complex structures like entire layouts and navigations. Flutter provides a rich set of predefined widgets to create various UI components, which can be combined to build a complex UI.

Common Flutter Widgets:

1. **Text Widget:**
    - **Used to display text on the screen. You can customize its style, size, color, and alignment.**
2. **Container Widget:**
    - **A box that can contain other widgets. It is used for styling, adding padding, margin, alignment, and background color to widgets.**
3. **Row and Column Widgets:**
    - **Row: Arranges widgets horizontally.**
    - **Column: Arranges widgets vertically.**
    - **These widgets are fundamental for creating flexible layouts and positioning UI elements.**
4. **Image Widget:**
    - **Used to display images in the app, either from assets, network, or file system.**
5. **Button Widgets:**
    - **Flutter offers several button widgets like `RaisedButton`, `FlatButton`, `ElevatedButton`, and `IconButton` that are used for interaction. These buttons are essential for handling user input and triggering actions.**
6. **TextField Widget:**
    - **Used for user input. It provides an editable field where the user can type text.**
7. **Scaffold Widget:**

    - **This is a top-level container that holds the structure of the UI. It includes the app bar, body, drawer, and bottom navigation bar. It provides a standard layout for the app.**
8. **ListView Widget:**
    - **A scrolling widget that allows the display of a long list of items. It is used for displaying dynamic content efficiently.**

Layouts in Flutter:

- **Padding: Adds space around a widget.**
- **Align: Aligns a widget within its parent.**
- **Expanded: Makes a widget expand to fill available space in a `Row`, `Column`, or `Flex`.**
- **Stack: Used for placing widgets on top of one another.**

Conclusion: We learned how to design a basic Flutter UI by utilizing common widgets such as Text, Container, Row, Column, Image, Button, TextField, ListView, and Scaffold. These widgets provide a flexible and powerful way to create UIs that are visually appealing and functional. By combining these widgets, you can build complex layouts that cater to your app's design needs.

- **Text and Container are fundamental for displaying text and styling.**
- **Row and Column are essential for structuring layouts, either horizontally or vertically.**
- **Buttons allow users to interact with the app.**
- **Scaffold provides a basic structure for the app, including app bars, bodies, and drawers.**
- **ListView is ideal for displaying lists of items, especially when the content is dynamic or long.**

Mastering these common widgets enables developers to design clean and efficient UIs that cater to the needs of modern mobile applications.

Code:

```
import 'package:crimetrack/validation/validator.dart';
import 'package:flutter/material.dart';
import 'package:firebase_auth/firebase_auth.dart';
import 'package:fluttertoast/fluttertoast.dart'; // Import FlutterToast
import 'verify_page.dart'; // Import VerifyEmailScreen
import '../app_colors.dart'; // Import AppColors

class RegScreen extends StatefulWidget {
  const RegScreen({Key? key}) : super(key: key);

  @override
  _RegScreenState createState() => _RegScreenState();
}

class _RegScreenState extends State<RegScreen> {
  final _formKey = GlobalKey<FormState>();
  final TextEditingController _nameController = TextEditingController();
  final TextEditingController _emailController = TextEditingController();
  final TextEditingController _passwordController = TextEditingController();
  final TextEditingController _confirmPasswordController = TextEditingController();

  bool _isPasswordVisible = false;
  bool _isConfirmPasswordVisible = false;
  bool _isLoading = false;

  FocusNode _nameFocusNode = FocusNode();
  FocusNode _emailFocusNode = FocusNode();
  FocusNode _passwordFocusNode = FocusNode();
  FocusNode _confirmPasswordFocusNode = FocusNode();

  @override
  void dispose() {
    _nameController.dispose();
    _emailController.dispose();
    _passwordController.dispose();
    _confirmPasswordController.dispose();
    _nameFocusNode.dispose();
    _emailFocusNode.dispose();
    _passwordFocusNode.dispose();
    _confirmPasswordFocusNode.dispose();
    super.dispose();
  }

  Future<void> _registerUser() async {
    if (_formKey.currentState?.validate() ?? false) {
      setState(() => _isLoading = true);
```

```
    try {
      UserCredential userCredential = await FirebaseAuth.instance
          .createUserWithEmailAndPassword(
          email: _emailController.text, password: _passwordController.text);

      // Set display name after user is created
      await userCredential.user?.updateDisplayName(_nameController.text);

      // Send email verification
      await userCredential.user?.sendEmailVerification();

      // Show success toast
      Fluttertoast.showToast(
        msg: "Registration Successful! Please verify your email.",
        toastLength: Toast.LENGTH_SHORT,
        gravity: ToastGravity.BOTTOM,
        timeInSecForIosWeb: 1,
        backgroundColor: AppColors.successColor,
        textColor: AppColors.textColor,
        fontSize: 16.0,
      );

      // Navigate to VerifyEmailScreen
      Navigator.pushReplacement(
        context,
        MaterialPageRoute(builder: (context) => VerifyEmailScreen()),
      );
    } catch (e) {
      // Show error toast
      Fluttertoast.showToast(
        msg: "Error: ${e.toString()}",
        toastLength: Toast.LENGTH_SHORT,
        gravity: ToastGravity.BOTTOM,
        timeInSecForIosWeb: 1,
        backgroundColor: AppColors.errorColor,
        textColor: AppColors.textColor,
        fontSize: 16.0,
      );
    } finally {
      setState(() => _isLoading = false);
    }
  }
}

@override
Widget build(BuildContext context) {
  return Scaffold(
    body: Stack(
```

```
      children: [
        // Background Gradient
        Container(
          height: double.infinity,
          width: double.infinity,
          decoration: const BoxDecoration(
            gradient: LinearGradient(
              colors: [AppColors.primaryColor, AppColors.secondaryColor],
            ),
          ),
          child: const Padding(
            padding: EdgeInsets.only(top: 60.0, left: 22),
            child: Text(
              'Create Your\nAccount',
              style: TextStyle(fontSize: 30, color: Colors.white, fontWeight: FontWeight.bold),
            ),
          ),
        ),
        Padding(
          padding: const EdgeInsets.only(top: 200.0),
          child: Container(
            decoration: const BoxDecoration(
              borderRadius: BorderRadius.only(topLeft: Radius.circular(40), topRight:
Radius.circular(40)),
              color: AppColors.backgroundColor,
            ),
            height: double.infinity,
            width: double.infinity,
            child: SingleChildScrollView(
              padding: const EdgeInsets.symmetric(horizontal: 18.0, vertical: 30),
              child: Form(
                key: _formKey,
                child: Column(
                  children: [
                    _buildTextField('Full Name', _nameController, false, Validator.validateName,
_nameFocusNode),
                    const SizedBox(height: 10),
                    _buildTextField('Email', _emailController, false, Validator.validateEmail,
_emailFocusNode),
                    const SizedBox(height: 10),
                    _buildTextField('Password', _passwordController, true,
Validator.validatePassword, _passwordFocusNode),
                    const SizedBox(height: 10),
                    _buildTextField('Confirm Password', _confirmPasswordController, true, (value) {
                      return Validator.validateConfirmPassword(value ?? '', _passwordController.text);
                    }, _confirmPasswordFocusNode),
                    const SizedBox(height: 50),
                    GestureDetector(
```

```
                    onTap: _isLoading ? null : _registerUser,
                    child: Container(
                      height: 55,
                      width: 300,
                      decoration: BoxDecoration(
                        borderRadius: BorderRadius.circular(30),
                        gradient: const LinearGradient(
                          colors: [AppColors.primaryColor, AppColors.secondaryColor],
                        ),
                      ),
                      child: Center(
                        child: _isLoading
                            ? const CircularProgressIndicator(color: Colors.white)
                            : const Text(
                          'SIGN UP',
                          style: TextStyle(fontWeight: FontWeight.bold, fontSize: 20, color:
AppColors.buttonTextColor),
                        ),
                      ),
                    ),
                  ),
                  const SizedBox(height: 50),
                ],
              ),
            ),
          ),
        ),
      ),
    ],
  ),
 );
}

 // Updated text field method
 Widget _buildTextField(String label, TextEditingController controller, bool isPassword, String?
Function(String?) validator, FocusNode focusNode) {
   return TextFormField(
     controller: controller,
     focusNode: focusNode, // Assign focus node
     obscureText: isPassword ? (!_isPasswordVisible && !_isConfirmPasswordVisible) : false,
     cursorColor: AppColors.primaryColor, // Set cursor color to primary
    // Set selection color to primary
     decoration: InputDecoration(
       labelText: label,
       labelStyle: TextStyle(
         fontWeight: FontWeight.bold,
         color: focusNode.hasFocus ? AppColors.primaryColor : AppColors.secondaryColor, //
Change label color on focus
```

```
        ),
        suffixIcon: isPassword
            ? IconButton(
          icon: Icon(
            label == 'Password' ? (_isPasswordVisible ? Icons.visibility : Icons.visibility_off)
                : (_isConfirmPasswordVisible ? Icons.visibility : Icons.visibility_off),
            color: Colors.grey,
          ),
          onPressed: () {
            setState(() {
              if (label == 'Password') {
                _isPasswordVisible = !_isPasswordVisible;
              } else {
                _isConfirmPasswordVisible = !_isConfirmPasswordVisible;
              }
            });
          },
        )
            : null,
      ),
      validator: validator,
      style: TextStyle(color: focusNode.hasFocus ? AppColors.primaryColor :
AppColors.textColor), // Text color on focus
    );
  }
}
```

Login Screen:

```
import 'package:flutter/material.dart';
import 'package:firebase_auth/firebase_auth.dart'; // Import FirebaseAuth package
import 'package:crimetrack/screens/forgot_password.dart'; // Import ForgotPasswordScreen
import 'package:crimetrack/screens/home_screen.dart'; // Import HomeScreen
import 'package:crimetrack/screens/register_screen.dart'; // Import RegisterScreen
import 'package:crimetrack/validation/validator.dart'; // Import Validator class
import '../app_colors.dart'; // Import AppColors class
import 'package:fluttertoast/fluttertoast.dart'; // Import fluttertoast

class LoginScreen extends StatefulWidget {
  const LoginScreen({Key? key}) : super(key: key);

  @override
  _LoginScreenState createState() => _LoginScreenState();
}

class _LoginScreenState extends State<LoginScreen> {
  final _formKey = GlobalKey<FormState>(); // Key to identify the form
  final TextEditingController _emailController = TextEditingController();
  final TextEditingController _passwordController = TextEditingController();
```

```
bool _isPasswordVisible = false; // Boolean variable to track password visibility
bool _isLoading = false; // Boolean to track loading state

@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(
      leading: IconButton(
        icon: const Icon(Icons.arrow_back),
        onPressed: () {
          Navigator.pop(context);
        },
        color: AppColors.backgroundColor, // Set the back button color to white
      ),
      backgroundColor: AppColors.primaryColor, // Use primaryColor from AppColors
      elevation: 0,
    ),
    body: Stack(
      children: [
        // Background gradient
        Container(
          height: double.infinity,
          width: double.infinity,
          decoration: BoxDecoration(
            gradient: LinearGradient(
              colors: [
                AppColors.primaryColor, // Dark Blue from AppColors
                AppColors.secondaryColor, // Light Blue from AppColors
              ],
            ),
          ),
          child: const Padding(
            padding: EdgeInsets.only(top: 60.0, left: 22),
            child: Text(
              'Hello\nSign in!',
              style: TextStyle(
                fontSize: 30,
                color: AppColors.backgroundColor, // White color from AppColors
                fontWeight: FontWeight.bold,
              ),
            ),
          ),
        ),
        // Login form container
        Padding(
          padding: const EdgeInsets.only(top: 200.0),
          child: Container(
```

```
            decoration: BoxDecoration(
              borderRadius: const BorderRadius.only(
                topLeft: Radius.circular(40),
                topRight: Radius.circular(40),
              ),
              color: AppColors.backgroundColor, // White background for the login form
            ),
            height: double.infinity,
            width: double.infinity,
            child: Padding(
              padding: const EdgeInsets.only(left: 18.0, right: 18),
              child: Form(
                key: _formKey, // Attach the form key
                child: Column(
                  mainAxisAlignment: MainAxisAlignment.center,
                  children: [
                    // Email input field with validation
                    TextFormField(
                      controller: _emailController,
                      decoration: InputDecoration(
                        suffixIcon: const Icon(
                          Icons.check,
                          color: Colors.grey,
                        ),
                        label: Text(
                          'Gmail',
                          style: TextStyle(
                            fontWeight: FontWeight.bold,
                            color: AppColors.secondaryColor, // Set the label color to secondary color
                          ),
                        ),
                        enabledBorder: UnderlineInputBorder(
                          borderSide: BorderSide(color: AppColors.primaryColor), // Set the border color
to primary color
                        ),
                        focusedBorder: UnderlineInputBorder(
                          borderSide: BorderSide(color: AppColors.primaryColor), // Set the border color
to primary color when focused
                        ),
                        hintStyle: TextStyle(
                          color: AppColors.primaryColor, // Set the hint text color to primary color
                        ),
                      ),
                      style: TextStyle(
                        color: AppColors.primaryColor, // Set the input text color to primary color
                      ),
                      validator: (value) {
                        return Validator.validateEmail(value); // Using Validator class to validate email
```

```
                  },
                ),
                const SizedBox(height: 20),
                // Password input field with validation and visibility toggle
                TextFormField(
                  controller: _passwordController,
                  obscureText: !_isPasswordVisible, // Toggle the visibility based on the boolean
value
                  decoration: InputDecoration(
                    suffixIcon: IconButton(
                      icon: Icon(
                        _isPasswordVisible
                            ? Icons.visibility
                            : Icons.visibility_off,
                        color: AppColors.primaryColor,
                      ),
                      onPressed: () {
                        setState(() {
                          _isPasswordVisible = !_isPasswordVisible; // Toggle password visibility
                        });
                      },
                    ),
                    label: Text(
                      'Password',
                      style: TextStyle(
                        fontWeight: FontWeight.bold,
                        color: AppColors.secondaryColor, // Set the label color to secondary color
                      ),
                    ),
                    enabledBorder: UnderlineInputBorder(
                      borderSide: BorderSide(color: AppColors.primaryColor), // Set the border color
to primary color
                    ),
                    focusedBorder: UnderlineInputBorder(
                      borderSide: BorderSide(color: AppColors.primaryColor), // Set the border color
to primary color when focused
                    ),
                    hintStyle: TextStyle(
                      color: AppColors.primaryColor, // Set the hint text color to primary color
                    ),
                  ),
                  style: TextStyle(
                    color: AppColors.primaryColor, // Set the input text color to primary color
                  ),
                  validator: (value) {
                    return Validator.validatePassword(value); // Using Validator class to validate
password
                  },
```

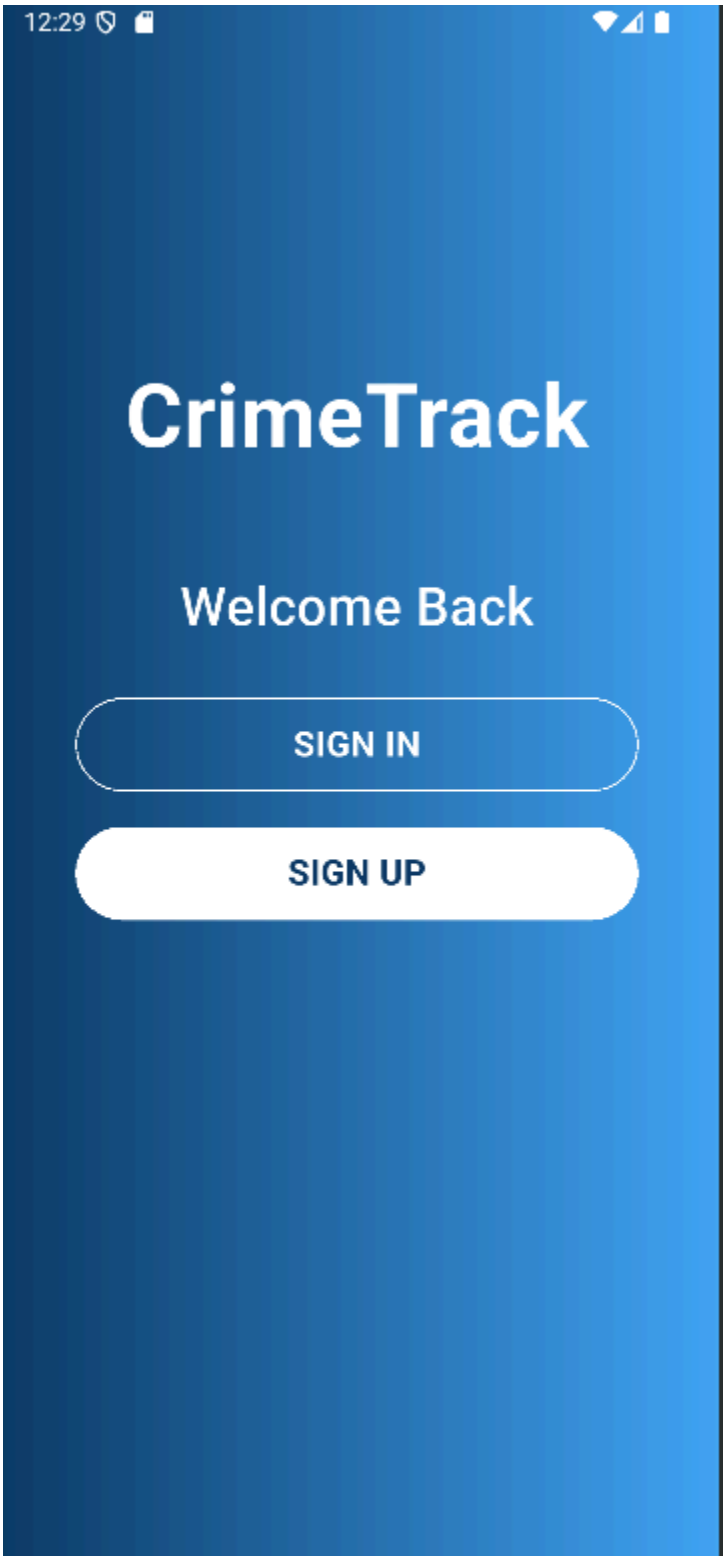
```
),
const SizedBox(height: 20),
// Forgot password text
Align(
  alignment: Alignment.centerRight,
  child: GestureDetector(
    onTap: () {
      // Navigate to ForgotPasswordScreen when tapped
      Navigator.push(
        context,
        MaterialPageRoute(
          builder: (context) => const ForgotPasswordScreen(),
        ),
      );
    },
    child: const Text(
      'Forgot Password?',
      style: TextStyle(
        fontWeight: FontWeight.bold,
        fontSize: 17,
        color: AppColors.secondaryColor, // Darker color for the text
      ),
    ),
  ),
),
const SizedBox(height: 70),
// Sign In button with loading indicator
GestureDetector(
  onTap: () async {
    if (_formKey.currentState!.validate()) {
      setState(() {
        _isLoading = true; // Set loading state to true
      });

      // Attempt login using Firebase Authentication
      try {
        UserCredential userCredential = await FirebaseAuth.instance
            .signInWithEmailAndPassword(
          email: _emailController.text,
          password: _passwordController.text,
        );

        // Check if the email is verified
        if (userCredential.user != null && userCredential.user!.emailVerified) {
          // Show success toast
          Fluttertoast.showToast(
            msg: "Login Successful",  // Toast message
            toastLength: Toast.LENGTH_SHORT,
```

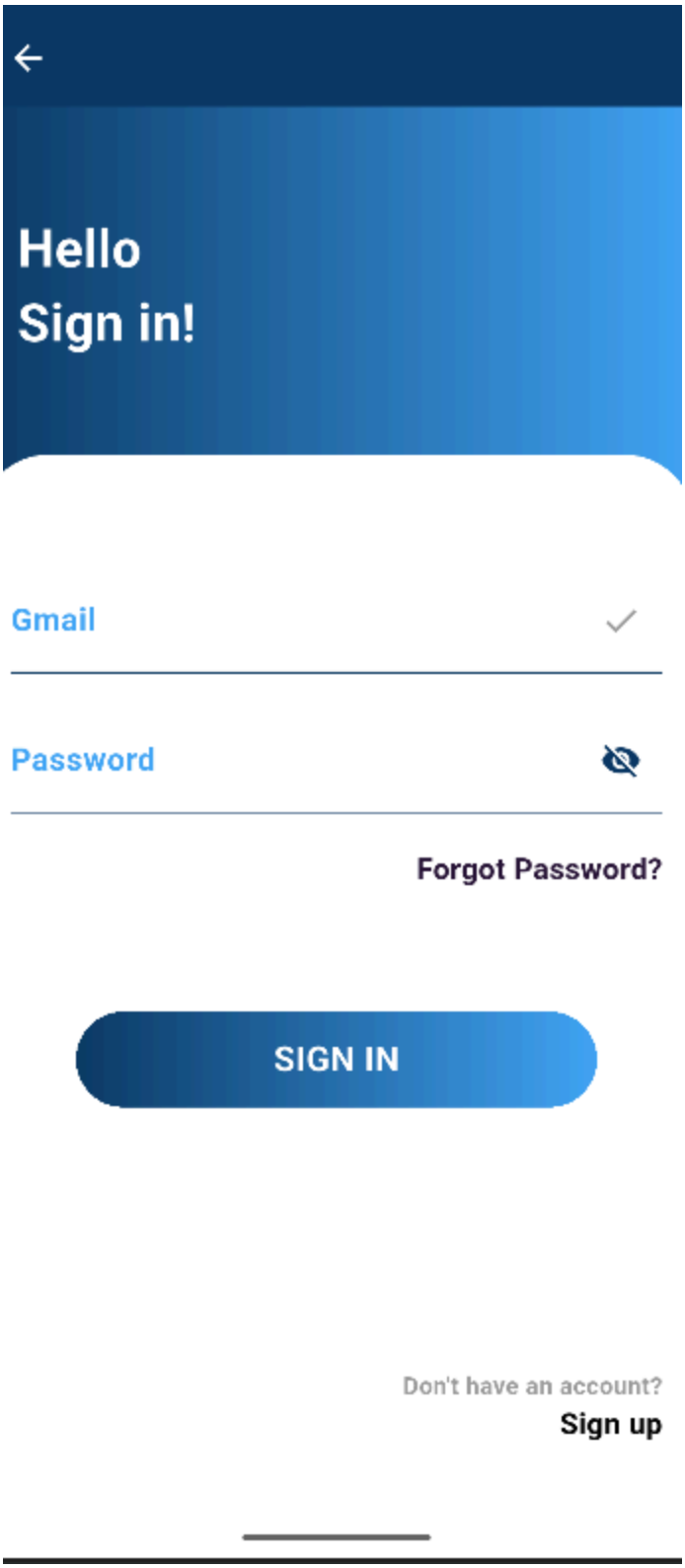
```
      gravity: ToastGravity.BOTTOM,
      timeInSecForIosWeb: 1,
      backgroundColor: Colors.green,
      textColor: Colors.white,
      fontSize: 16.0,
    );

    Navigator.push(
      context,
      MaterialPageRoute(
        builder: (context) => const HomeScreen(),
      ),
    );
  } else {
    // Show email verification message as toast
    Fluttertoast.showToast(
      msg: "Please verify your email before logging in.",
      toastLength: Toast.LENGTH_SHORT,
      gravity: ToastGravity.BOTTOM,
      timeInSecForIosWeb: 1,
      backgroundColor: Colors.orange,
      textColor: Colors.white,
      fontSize: 16.0,
    );
  }
} catch (e) {
  String errorMessage = 'Error: Invalid Credentials';

  // Handle specific Firebase errors
  if (e is FirebaseAuthException) {
    if (e.code == 'user-not-found') {
      errorMessage = 'No user found for that email.';
    } else if (e.code == 'wrong-password') {
      errorMessage = 'Incorrect password.';
    } else if (e.code == 'invalid-email') {
      errorMessage = 'Invalid email address.';
    }
  }

  // Show error toast
  Fluttertoast.showToast(
    msg: errorMessage,  // Display the error message in toast
    toastLength: Toast.LENGTH_SHORT,
    gravity: ToastGravity.BOTTOM,
    timeInSecForIosWeb: 1,
    backgroundColor: Colors.red,
    textColor: Colors.white,
    fontSize: 16.0,
```

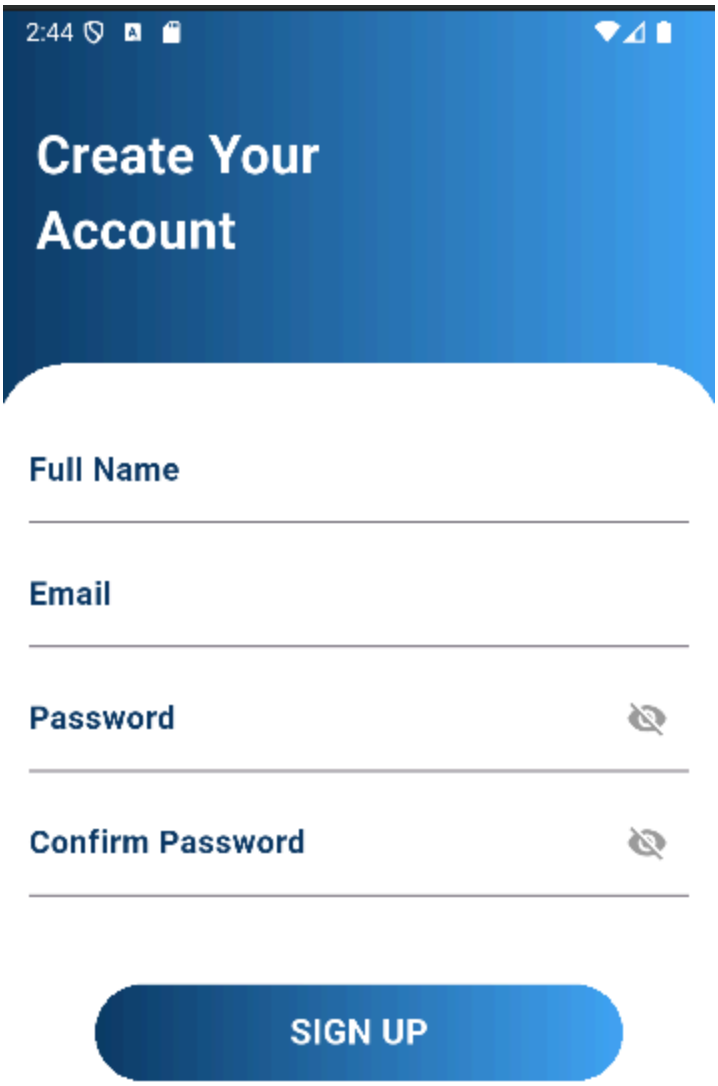
```
        );
      } finally {
        setState(() {
          _isLoading = false; // Set loading state to false
        });
      }
    }
  },
  child: _isLoading
      ? const CircularProgressIndicator() // Show loading indicator while processing
      : Container(
          height: 55,
          width: 300,
          decoration: BoxDecoration(
            borderRadius: BorderRadius.circular(30),
            gradient: LinearGradient(
              colors: [
                AppColors.primaryColor,
                AppColors.secondaryColor,
              ],
            ),
          ),
          child: const Center(
            child: Text(
              'SIGN IN',
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 20,
                color: AppColors.backgroundColor,
              ),
            ),
          ),
        ),
),
const SizedBox(height: 150),
// Sign up link
Align(
  alignment: Alignment.bottomRight,
  child: Column(
    crossAxisAlignment: CrossAxisAlignment.end,
    children: [
      const Text(
        "Don't have an account?",
        style: TextStyle(
          fontWeight: FontWeight.bold,
          color: Colors.grey,
        ),
      ),
```

```
                    GestureDetector(
                      onTap: () {
                        // Navigate to the Register screen
                        Navigator.push(
                          context,
                          MaterialPageRoute(
                            builder: (context) => const RegScreen(), // Navigate to RegisterScreen
                          ),
                        );
                      },
                      child: const Text(
                        "Sign up",
                        style: TextStyle(
                          fontWeight: FontWeight.bold,
                          fontSize: 17,
                          color: AppColors.primaryColor, // Black color for "Sign up"
                        ),
                      ),
                    ),
                  ],
                ),
              ),
            ],
          ),
        ),
      ),
    ),
  ],
),
),
);
}
}
```

Output:




Hello
Sign in!
Gmail
Password
Forgot Password?
SIGN IN
Don't have an account?
Sign up


2:44
Create Your Account
Full Name
Email
Password
Confirm Password
SIGN UP