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SARDAR PATEL INSTITUTE OF TECHNOLOGY
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Experiment	6
Aim	Create an app for children where children can learn numbers and alphabets
Objective	<ul style="list-style-type: none">• To Create App of children• To use Upper Tabs in navigation bar• To implement Splash Screen in Flutter
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Class	FYMCA
Batch	D
Date of Submission	

Technology used	Visual Studio Code
Task	. Children should be able to even recognize the numbers and alphabets by quiz form. Create 4 upper Tabs with Splash Screen at the start: 1) Practice/Lessons 2) Quiz 3) Leader Board 4) Profile
Code with proper label	<pre>Score_model.dart: class ScoreModel { final int score; final DateTime date; ScoreModel({required this.score, required this.date}); factory ScoreModel.fromString(String str) { final parts = str.split(' '); return ScoreModel(score: int.parse(parts[0]), date: DateTime.parse(parts[1]),); } @override String toString() => '\$score \${date.toIso8601String()}'; } Home_screen.dart: import 'package:flutter/material.dart'; import 'lessons_tab.dart'; import 'quiz_tab.dart'; import 'scoreboard_tab.dart'; import 'profile_tab.dart'; class HomeScreen extends StatelessWidget { const HomeScreen({super.key}); @override Widget build(BuildContext context) {</pre>



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```
return DefaultTabController(
  length: 4,
  child: Scaffold(
    appBar: AppBar(
      backgroundColor: Colors.blue[300],
      title: const Text('Kids Learning App'),
      bottom: const TabBar(
        indicatorColor: Colors.white,
        tabs: [
          Tab(icon: Icon(Icons.book), text: 'Lessons'),
          Tab(icon: Icon(Icons.quiz), text: 'Quiz'),
          Tab(icon: Icon(Icons.score), text: 'Scoreboard'),
          Tab(icon: Icon(Icons.person), text: 'Profile'),
        ],
      ),
    ),
    body: const TabBarView(
      children: [
        LessonsTab(),
        QuizTab(),
        ScoreboardTab(),
        ProfileTab(),
      ],
    ),
  ),
);
}
}
Lessons_tab.dart:
import 'package:flutter/material.dart';

class LessonsTab extends StatelessWidget {
  const LessonsTab({super.key});

  @override
  Widget build(BuildContext context) {
    return Container(
      color: Colors.teal[50],
      padding: const EdgeInsets.all(16),
      child: ListView(
        children: [
          const Text(
            'Alphabets',
            style: TextStyle(
              fontSize: 24,
              fontWeight: FontWeight.bold,
              color: Colors.indigo,
            ),
          ),
          GridView.count(
            shrinkWrap: true,
            physics: const NeverScrollableScrollPhysics(),
            crossAxisCount: 3,
            childAspectRatio: 1,
            mainAxisSpacing: 10,
            crossAxisSpacing: 10,
            children: List.generate(26, (index) {
              return Container(
                decoration: BoxDecoration(
```



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```
gradient: LinearGradient(  
  colors: [Colors.blue[200]!, Colors.purple[200]!],  
  begin: Alignment.topLeft,  
  end: Alignment.bottomRight,  
),  
borderRadius: BorderRadius.circular(12),  
),  
child: Center(  
  child: Text(  
    String.fromCharCode(65 + index),  
    style: const TextStyle(  
      fontSize: 24,  
      fontWeight: FontWeight.bold,  
      color: Colors.white,  
    ),  
  ),  
),  
);  
}),  
,  
const SizedBox(height: 20),  
const Text(  
  'Numbers',  
  style: TextStyle(  
    fontSize: 24,  
    fontWeight: FontWeight.bold,  
    color: Colors.indigo,  
  ),  
,  
),  
GridView.count(  
  shrinkWrap: true,  
  physics: const NeverScrollableScrollPhysics(),  
  crossAxisCount: 3,  
  childAspectRatio: 1,  
  mainAxisSpacing: 10,  
  crossAxisSpacing: 10,  
  children: List.generate(10, (index) {  
    return Container(  
      decoration: BoxDecoration(  
        gradient: LinearGradient(  
          colors: [Colors.orange[200]!, Colors.red[200]!],  
          begin: Alignment.topLeft,  
          end: Alignment.bottomRight,  
        ),  
        borderRadius: BorderRadius.circular(12),  
      ),  
      child: Center(  
        child: Text(  
          '$index',  
          style: const TextStyle(  
            fontSize: 24,  
            fontWeight: FontWeight.bold,  
            color: Colors.white,  
          ),  
        ),  
      ),  
    );  
  }  
),  
,
```



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```
],  
,  
);  
}  
}  
  
Profile_tab.dart:  
import 'dart:convert';  
import 'package:flutter/material.dart';  
import 'package:image_picker/image_picker.dart';  
import 'package:shared_preferences/shared_preferences.dart';  
import 'dart:typed_data';  
  
class ProfileTab extends StatefulWidget {  
  const ProfileTab({super.key});  
  
  @override  
  State<ProfileTab> createState() => _ProfileTabState();  
}  
  
class _ProfileTabState extends State<ProfileTab> {  
  Uint8List? _imageBytes; // Store image as bytes for web  
  final TextEditingController _nameController = TextEditingController();  
  final TextEditingController _addressController = TextEditingController();  
  final ImagePicker _picker = ImagePicker();  
  
  @override  
  void initState() {  
    super.initState();  
    _loadProfile();  
  }  
  
  Future<void> _loadProfile() async {  
    final prefs = await SharedPreferences.getInstance();  
    setState(() {  
      _nameController.text = prefs.getString('name') ?? "";  
      _addressController.text = prefs.getString('address') ?? "";  
      String? base64Image = prefs.getString('profile_image');  
      if (base64Image != null) {  
        _imageBytes = base64Decode(base64Image);  
      }  
    });  
  }  
  
  Future<void> _pickImage() async {  
    try {  
      final XFile? pickedFile = await _picker.pickImage(  
        source: ImageSource.gallery,  
        imageQuality: 85,  
        maxWidth: 800,  
      );  
  
      if (pickedFile != null) {  
        final bytes = await pickedFile.readAsBytes();  
        final base64Image = base64Encode(bytes);  
  
        // Save the base64 string in SharedPreferences  
        final prefs = await SharedPreferences.getInstance();  
        await prefs.setString('profile_image', base64Image);  
      }  
    } catch (e) {}  
  }  
}
```



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```
    setState() {
      _imageBytes = bytes;
    });
  }
} catch (e) {
  ScaffoldMessenger.of(context).showSnackBar(
    SnackBar(content: Text('Error selecting image: $e')),
  );
}
}

Future<void> _saveProfile() async {
  final prefs = await SharedPreferences.getInstance();
  await prefs.setString('name', _nameController.text);
  await prefs.setString('address', _addressController.text);
  ScaffoldMessenger.of(context).showSnackBar(
    const SnackBar(content: Text('Profile saved!')),
  );
}

@override
Widget build(BuildContext context) {
  return Container(
    color: Colors.purple[100],
    padding: const EdgeInsets.all(16),
    child: SingleChildScrollView(
      child: Column(
        children: [
          GestureDetector(
            onTap: _pickImage,
            child: Container(
              width: 120,
              height: 120,
              decoration: BoxDecoration(
                shape: BoxShape.circle,
                color: Colors.blue[200],
                image: _imageBytes != null
                  ? DecorationImage(
                      image: MemoryImage(_imageBytes!),
                      fit: BoxFit.cover,
                    )
                  : null,
            ),
          ),
          child: _imageBytes == null
            ? const Icon(
                Icons.person,
                size: 60,
                color: Colors.white,
              )
            : null,
        ],
      ),
      const SizedBox(height: 10),
      const Text(
        'Tap to select photo',
        style: TextStyle(color: Colors.white70),
      ),
      const SizedBox(height: 20),
    ),
  );
}
```



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```
TextField(
  controller: _nameController,
  decoration: const InputDecoration(
    labelText: 'Name',
    border: OutlineInputBorder(),
    filled: true,
    fillColor: Colors.white,
  ),
),
const SizedBox(height: 20),
TextField(
  controller: _addressController,
  decoration: const InputDecoration(
    labelText: 'Address',
    border: OutlineInputBorder(),
    filled: true,
    fillColor: Colors.white,
  ),
),
const SizedBox(height: 20),
ElevatedButton(
  style: ElevatedButton.styleFrom(
    backgroundColor: Colors.green[300],
    padding: const EdgeInsets.symmetric(vertical: 15),
    minimumSize: const Size(double.infinity, 50),
  ),
  onPressed: _saveProfile,
  child: const Text(
    'Save Profile',
    style: TextStyle(fontSize: 18, color: Colors.white),
  ),
),
),
],
),
);
}

@override
void dispose() {
  _nameController.dispose();
  _addressController.dispose();
  super.dispose();
}

Quiz_tab.dart:
import 'package:flutter/material.dart';
import 'package:shared_preferences/shared_preferences.dart';
import '../models/score_model.dart';

class QuizTab extends StatefulWidget {
  const QuizTab({super.key});

  @override
  State<QuizTab> createState() => _QuizTabState();
}

class _QuizTabState extends State<QuizTab> {
```



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```
int score = 0;
int currentQuestion = 0;

final List<Map<String, dynamic>> questions = [
  {
    'question': 'What comes after A?',
    'options': ['B', 'C', 'D'],
    'correct': 'B'
  },
  {
    'question': 'What is 2 + 3?',
    'options': ['4', '5', '6'],
    'correct': '5'
  },
  {
    'question': 'Which letter comes before C?',
    'options': ['A', 'B', 'D'],
    'correct': 'B'
  },
  {
    'question': 'What is 5 - 2?',
    'options': ['3', '2', '4'],
    'correct': '3'
  },
  {
    'question': 'What comes after 9?',
    'options': ['8', '10', '11'],
    'correct': '10'
  },
];

void checkAnswer(String selectedAnswer) {
  if (selectedAnswer == questions[currentQuestion]['correct']) {
    score += 10;
  }
  setState(() {
    currentQuestion++;
  });
}

void saveScore() async {
  final prefs = await SharedPreferences.getInstance();
  List<String> scores = prefs.getStringList('scores') ?? [];
  scores.add(ScoreModel(score: score, date: DateTime.now()).toString());
  await prefs.setStringList('scores', scores);
  setState(() {
    score = 0;
    currentQuestion = 0;
  });
}

@override
Widget build(BuildContext context) {
  return Container(
    color: Colors.pink[50],
    padding: const EdgeInsets.all(16),
    child: Column(
      children: [
        if (currentQuestion < questions.length)
```



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	<pre>Column(children: [Container(padding: const EdgeInsets.all(16), decoration: BoxDecoration(color: Colors.blue[100], borderRadius: BorderRadius.circular(12),), child: Text(questions[currentQuestion]['question'], style: const TextStyle(fontSize: 20, fontWeight: FontWeight.bold, color: Colors.indigo,),),),],) const SizedBox(height: 20), ...List.generate(3, (index) { return Padding(padding: const EdgeInsets.symmetric(vertical: 8), child: ElevatedButton(style: ElevatedButton.styleFrom(backgroundColor: Colors.purple[200], padding: const EdgeInsets.symmetric(vertical: 15), minimumSize: const Size(double.infinity, 50),), onPressed: () => checkAnswer(questions[currentQuestion]['options'][index]), child: Text(questions[currentQuestion]['options'][index], style: const TextStyle(fontSize: 18, color: Colors.white,),),),); }),],) else Column(children: [Container(padding: const EdgeInsets.all(16), decoration: BoxDecoration(color: Colors.green[100], borderRadius: BorderRadius.circular(12),), child: Text('Quiz Completed! Score: \$score', style: const TextStyle(fontSize: 24, fontWeight: FontWeight.bold, color: Colors.indigo,),),),],),</pre>
--	---



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```
const SizedBox(height: 20),
ElevatedButton(
  style: ElevatedButton.styleFrom(
    backgroundColor: Colors.green[300],
    padding: const EdgeInsets.symmetric(vertical: 15),
    minimumSize: const Size(double.infinity, 50),
  ),
  onPressed: saveScore,
  child: const Text(
    'Save Score',
    style: TextStyle(fontSize: 18, color: Colors.white),
  ),
),
),
],
),
],
),
);
}
}

Scoreboard_tab.dart:
import 'package:flutter/material.dart';
import 'package:shared_preferences/shared_preferences.dart';
import '../models/score_model.dart';

class ScoreboardTab extends StatefulWidget {
  const ScoreboardTab({super.key});

  @override
  State<ScoreboardTab> createState() => _ScoreboardTabState();
}

class _ScoreboardTabState extends State<ScoreboardTab> {
  List<ScoreModel> scores = [];

  @override
  void initState() {
    super.initState();
    loadScores();
  }

  void loadScores() async {
    final prefs = await SharedPreferences.getInstance();
    List<String> scoreStrings = prefs.getStringList('scores') ?? [];
    setState(() {
      scores = scoreStrings.map((s) => ScoreModel.fromString(s)).toList()
        ..sort((a, b) => b.score.compareTo(a.score));
    });
  }

  @override
  Widget build(BuildContext context) {
    return Container(
      color: Colors.orange[100],
      padding: const EdgeInsets.all(16),
      child: ListView.builder(
        itemCount: scores.length,
        itemBuilder: (context, index) {
```



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```
return Card(  
  color: Colors.yellow[200],  
  child: ListTile(  
    title: Text('Score: ${scores[index].score}'),  
    subtitle: Text('Date: ${scores[index].date.toString().substring(0, 10)}'),  
  ),  
);  
},  
),  
);  
}  
}
```

```
Splash_screen.dart:  
import 'package:flutter/material.dart';  
import 'home_screen.dart';  
  
class SplashScreen extends StatefulWidget {  
  const SplashScreen({super.key});  
  
  @override  
  State<SplashScreen> createState() => _SplashScreenState();  
}  
  
class _SplashScreenState extends State<SplashScreen> {  
  @override  
  void initState() {  
    super.initState();  
    Future.delayed(const Duration(seconds: 3), () {  
      Navigator.pushReplacement(  
        context,  
        MaterialPageRoute(builder: (context) => const HomeScreen()),  
      );  
    });  
  }  
  
  @override  
  Widget build(BuildContext context) {  
    return Scaffold(  
      backgroundColor: Colors.yellow[100],  
      body: Center(  
        child: Column(  
          mainAxisAlignment: MainAxisAlignment.center,  
          children: [  
            const Icon(Icons.child_care, size: 100, color: Colors.purple),  
            const SizedBox(height: 20),  
            Text(  
              'Kids Learning',  
              style: TextStyle(  
                fontSize: 32,  
                fontWeight: FontWeight.bold,  
                color: Colors.purple[800],  
              ),  
            ),  
          ],  
        ),  
      ),  
    );  
  }  
}
```



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	<pre>} Main.dart: import 'package:flutter/material.dart'; import 'screens/splash_screen.dart'; void main() { runApp(const MyApp()); } class MyApp extends StatelessWidget { const MyApp({super.key}); @override Widget build(BuildContext context) { return MaterialApp(title: 'Kids Learning App', debugShowCheckedModeBanner: false, theme: ThemeData(primarySwatch: Colors.blue, visualDensity: VisualDensity.adaptivePlatformDensity,), home: const SplashScreen(),); } }</pre>
Screenshots	
Question and Answers	<p>Answer the following Questions:</p> <ol style="list-style-type: none">How to create Upper Tabs in Flutter? <p>Solu: In the "Kids Learning App," upper tabs are created using the DefaultTabController and TabBar widgets in the HomeScreen class. The TabBar is placed in the bottom property of the AppBar, defining four tabs with icons and text for Lessons, Quiz, Scoreboard, and Profile. The TabBarView in the Scaffold body syncs with the TabBar, displaying corresponding widgets (LessonsTab, QuizTab, ScoreboardTab, ProfileTab) for each tab. This setup ensures smooth navigation and a cohesive tabbed interface.</p> <ol style="list-style-type: none">How did you use 60-30-10 rule in your application? <p>Solu:</p> <p>The 60-30-10 color rule is applied in the app by using primary colors like blue and purple (e.g., Colors.blue[300] for the app bar) for 60% of the UI, setting the dominant tone. Secondary colors like teal, pink, and orange (e.g., Colors.teal[50], Colors.pink[50]) cover 30%, used in tab backgrounds for visual distinction. Accent colors, such as white and darker shades (e.g., Colors.purple[800]), constitute 10%, enhancing text, icons, and buttons for emphasis. This balanced color scheme creates a vibrant, kid-friendly aesthetic.</p>



	<p>3. Which new elements did you use for creating UI components?</p> <p>Solu: The app employs LinearGradient for visually appealing backgrounds in the LessonsTab grid items, transitioning between colors like blue to purple and orange to red. The GridView.count with NeverScrollableScrollPhysics is used to display alphabets and numbers in a non-scrollable grid within a ListView. The ImagePicker in the ProfileTab enables photo selection, stored as base64-encoded bytes. Additionally, Card and ListTile in the ScoreboardTab create structured, elevated score displays.</p> <p>4. In pubspec.yaml file, what dependencies need to be there?</p> <p>Solu: The pubspec.yaml file requires the flutter dependency as the core framework for building the app. The shared_preferences dependency is essential for storing profile data and quiz scores persistently. The image_picker dependency is needed for the profile photo selection feature in the ProfileTab. These dependencies support the app's functionality for data persistence and image handling.</p> <p>5. What is the use of Splash Screen?</p> <p>Solu: The splash screen in the "Kids Learning App" displays a centered icon and the app's title, "Kids Learning," on a yellow background for 3 seconds, creating a welcoming introduction. It uses a Future.delayed to transition to the HomeScreen, ensuring a smooth user experience. The screen enhances brand recognition with a kid-friendly design. It also provides time for any initial app setup or data loading.</p>
Conclusion	Learned a different way to create a splash screen – understood how to create a leaderboard and save data locally.

Screenshots:



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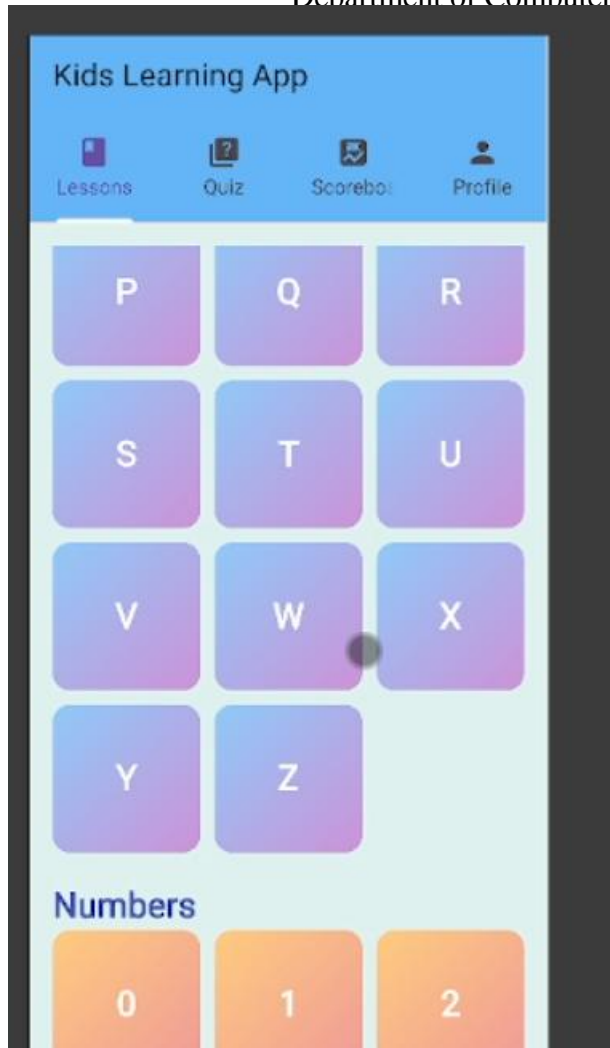


Kids Learning



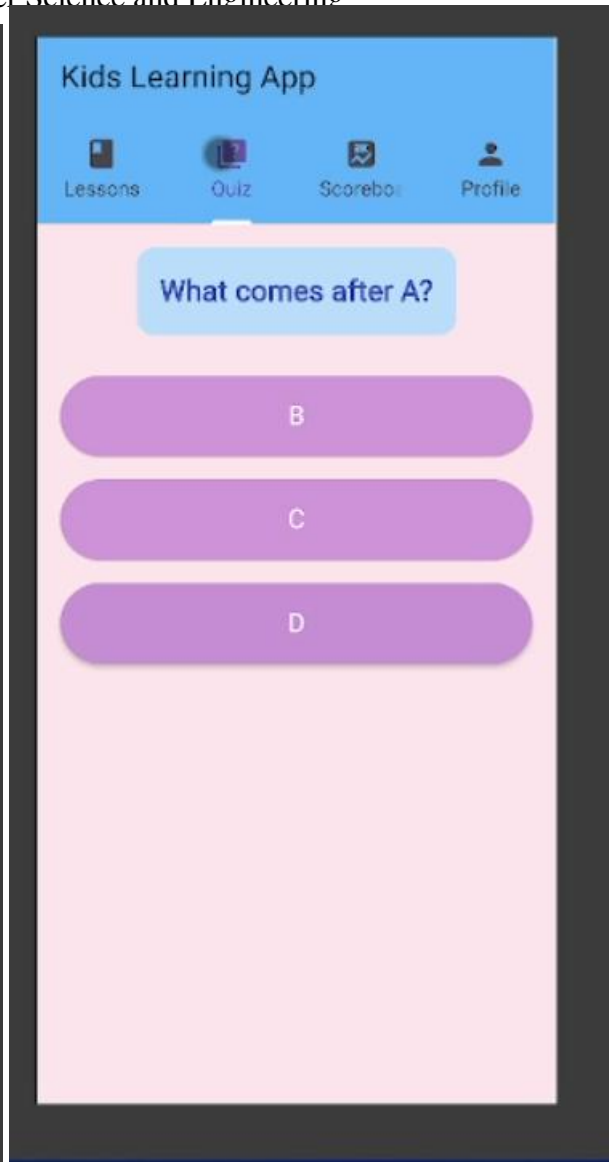
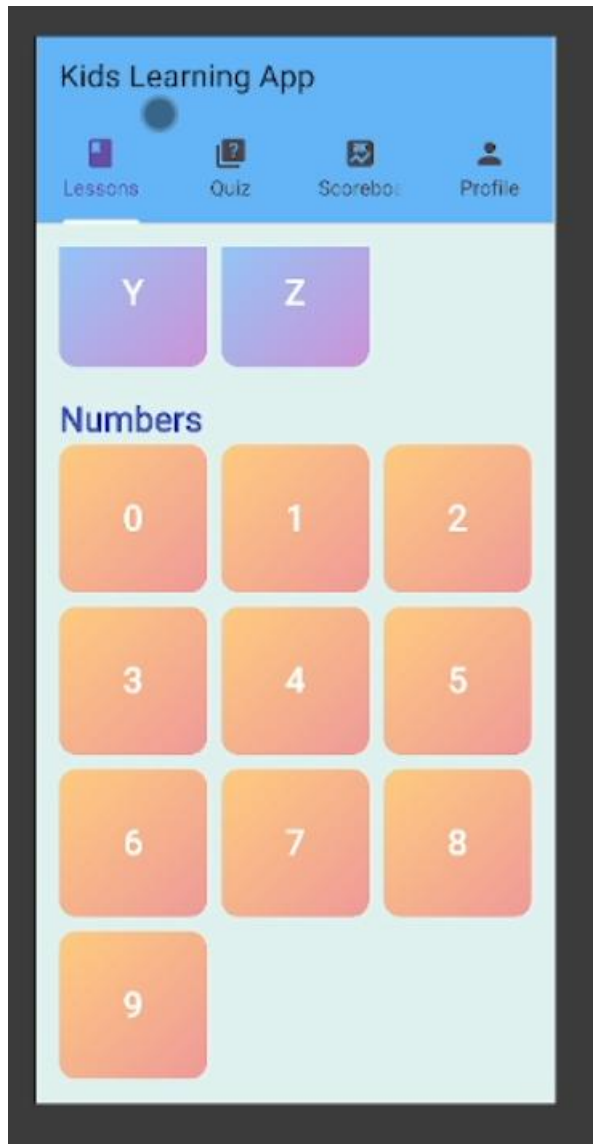


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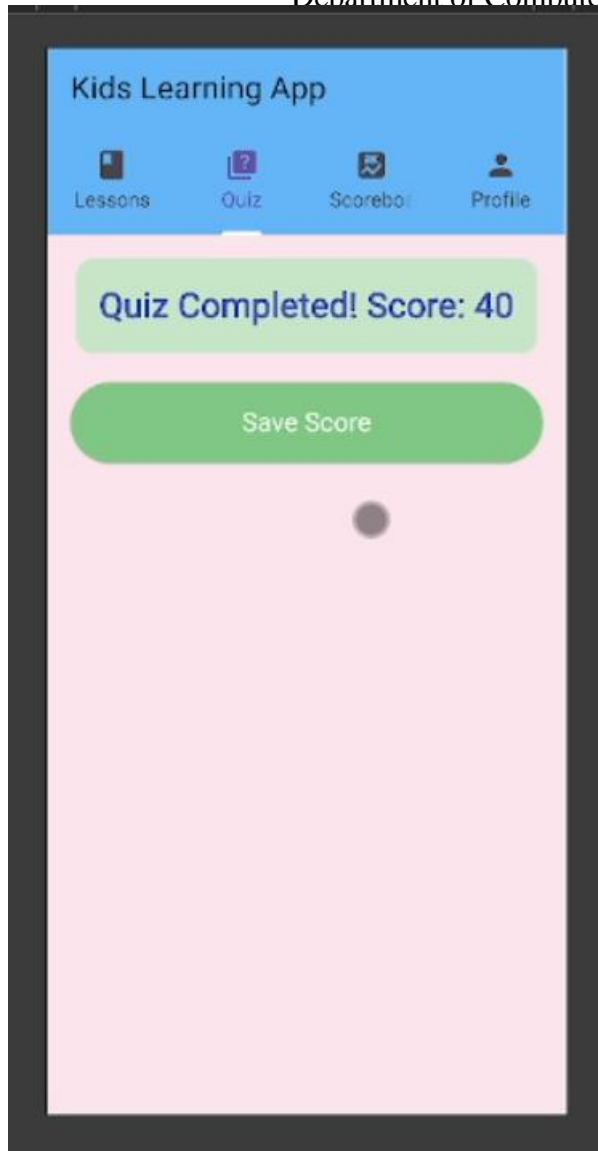


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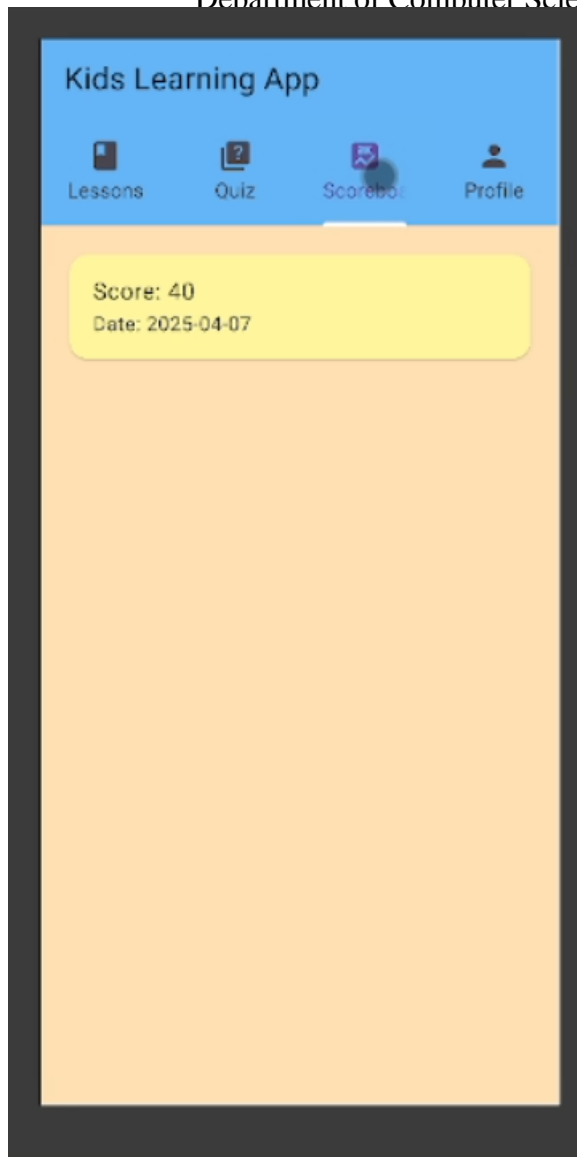


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Kids Learning App

Lessons Quiz Scorebox Profile

Tap to select photo

Name

Address

Save Profile



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Kids Learning App

Lessons

Quiz

Scoreboard

Profile



Tap to select photo

Name

Achijit Khambekar

Address

100th Charming Avenue

Save Profile

Profile saved!