

Mobile Application Development Lab Report

Department of Computer Science

NUML

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Report: Lab 01

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Lab Task 1: state management using the Provider

Code Snippet Attendance Model

```
1 import 'package:flutter/foundation.dart';
2 import 'student.dart';
3
4 class AttendanceModel extends ChangeNotifier {
5
6   final List<Student> _students = [
7     Student(id: 1, name: 'Alice Johnson', isPresent: false),
8     Student(id: 2, name: 'Bob Smith', isPresent: false),
9     Student(id: 3, name: 'Charlie Brown', isPresent: false),
10    Student(id: 4, name: 'Diana Prince', isPresent: false),
11    Student(id: 5, name: 'Ethan Hunt', isPresent: false),
12    Student(id: 6, name: 'Fiona Green', isPresent: false),
13    Student(id: 7, name: 'George Miller', isPresent: false),
14    Student(id: 8, name: 'Hannah Montana', isPresent: false),
15    Student(id: 9, name: 'Isaac Newton', isPresent: false),
16    Student(id: 10, name: 'Julia Roberts', isPresent: false),
17  ];
18
19
20  List<Student> get students => List.unmodifiable(_students);
21
22
23  void toggleAttendance(int studentId) {
24    final index = _students.indexWhere((student) => student.id ==
25      studentId);
26    if (index != -1) {
27      _students[index] = _students[index].copyWith(
28        isPresent: !_students[index].isPresent,
29      );
30      notifyListeners();
31    }
32  }
33
34  void markAllAbsent() {
35    for (int i = 0; i < _students.length; i++) {
36      _students[i] = _students[i].copyWith(isPresent: false);
37    }
38    notifyListeners();
39  }
40
41
42  int getPresentCount() {
43    return _students.where((student) => student.isPresent).length;
44  }
45
46
47  Student? getStudentById(int studentId) {
48    try {
49      return _students.firstWhere((student) => student.id == studentId)
50        ;
51    } catch (e) {
52      return null;
53    }
54  }
```

```

52     }
53   }
54
55   bool getStudentAttendance(int studentId) {
56     return getStudentById(studentId)?.isPresent ?? false;
57   }
58 }

```

Listing 1: attendance-model.dart

Code Snippet Student Model

```

1
2 class Student {
3   final int id;
4   final String name;
5   bool isPresent;
6
7   Student({
8     required this.id,
9     required this.name,
10    this.isPresent = false,
11  });
12
13
14  Student copyWith({
15    int? id,
16    String? name,
17    bool? isPresent,
18  }) {
19    return Student(
20      id: id ?? this.id,
21      name: name ?? this.name,
22      isPresent: isPresent ?? this.isPresent,
23    );
24  }
25
26  @override
27  String toString() => 'Student(id: $id, name: $name, isPresent:
    $isPresent)';
28 }

```

Listing 2: Student.dart

Code Snippet Widget (Student)

```

1 import 'package:flutter/material.dart';
2 import 'package:provider/provider.dart';
3 import '../models/attendance_model.dart';
4 import '../models/student.dart';
5
6 class StudentRow extends StatelessWidget {
7   final Student student;
8
9   const StudentRow({
10    Key? key,

```

```

11     required this.student,
12   }) : super(key: key);
13
14   @override
15   Widget build(BuildContext context) {
16
17     final isPresent = context.select<AttendanceModel, bool>(
18       (model) => model.getStudentAttendance(student.id),
19     );
20
21     return Container(
22       margin: const EdgeInsets.symmetric(horizontal: 8, vertical: 4),
23       decoration: BoxDecoration(
24         borderRadius: BorderRadius.circular(8),
25         color: isPresent ? Colors.green.withOpacity(0.1) : Colors.red.
           withOpacity(0.1),
26       ),
27       child: ListTile(
28         title: Text(
29           student.name,
30           style: TextStyle(
31             fontWeight: FontWeight.w500,
32             color: isPresent ? Colors.green.shade700 : Colors.grey.
               shade700,
33           ),
34         ),
35         trailing: Switch(
36           value: isPresent,
37           onChanged: (value) {
38
39             context.read<AttendanceModel>().toggleAttendance(student.id
               );
40           },
41           activeColor: Colors.green,
42         ),
43       ),
44     );
45   }
46 }

```

Listing 3: Student-row.dart

Code Snippet Main

```

1 import 'package:flutter/material.dart';
2 import 'package:provider/provider.dart';
3 import '../models/attendance_model.dart';
4 import '../widgets/student_row.dart';
5
6 void main() {
7   runApp(const MyApp());
8 }
9
10 class MyApp extends StatelessWidget {
11   const MyApp({Key? key}) : super(key: key);
12
13   @override

```

```

14 Widget build(BuildContext context) {
15   return MaterialApp(
16     debugShowCheckedModeBanner: false,
17     title: 'Attendance Tracker',
18     theme: ThemeData(
19       primarySwatch: Colors.blue,
20       useMaterial3: true,
21     ),
22     home: ChangeNotifierProvider(
23       create: (context) => AttendanceModel(),
24       child: const AttendanceScreen(),
25     ),
26   );
27 }
28 }
29
30 class AttendanceScreen extends StatelessWidget {
31   const AttendanceScreen({Key? key}) : super(key: key);
32
33   @override
34   Widget build(BuildContext context) {
35     return Scaffold(
36       appBar: _buildAppBar(context),
37       body: _buildStudentList(context),
38       floatingActionButton: _buildFloatingActionButton(context),
39     );
40   }
41
42   PreferredSizeWidget _buildAppBar(BuildContext context) {
43     return AppBar(
44       title: Consumer<AttendanceModel>(
45         builder: (context, attendanceModel, _) {
46           final presentCount = attendanceModel.getPresentCount();
47           final totalCount = attendanceModel.students.length;
48           return Text(
49             'Attendance: $presentCount/$totalCount Present',
50             style: const TextStyle(fontSize: 18, fontWeight: FontWeight
               .bold),
51           );
52         },
53       ),
54       elevation: 4,
55       backgroundColor: Colors.blue.shade700,
56     );
57   }
58
59   Widget _buildStudentList(BuildContext context) {
60     return Consumer<AttendanceModel>(
61       builder: (context, attendanceModel, _) {
62         final students = attendanceModel.students;
63
64         if (students.isEmpty) {
65           return const Center(
66             child: Text('No students available'),
67           );
68         }
69       }
70     );

```

```

71     return ListView.builder(
72       itemCount: students.length,
73       itemBuilder: (context, index) {
74         return StudentRow(student: students[index]);
75       },
76     );
77   },
78 );
79 }
80
81
82 Widget _buildFloatingActionButton(BuildContext context) {
83   return FloatingActionButton.extended(
84     onPressed: () {
85       context.read<AttendanceModel>().markAllAbsent();
86       ScaffoldMessenger.of(context).showSnackBar(
87         const SnackBar(
88           content: Text('All students marked as absent'),
89           duration: Duration(seconds: 2),
90         ),
91       );
92     },
93     icon: const Icon(Icons.clear_all),
94     label: const Text('Mark All Absent'),
95     backgroundColor: Colors.red.shade600,
96   );
97 }
98 }

```

Listing 4: main.dart

Output Screenshot

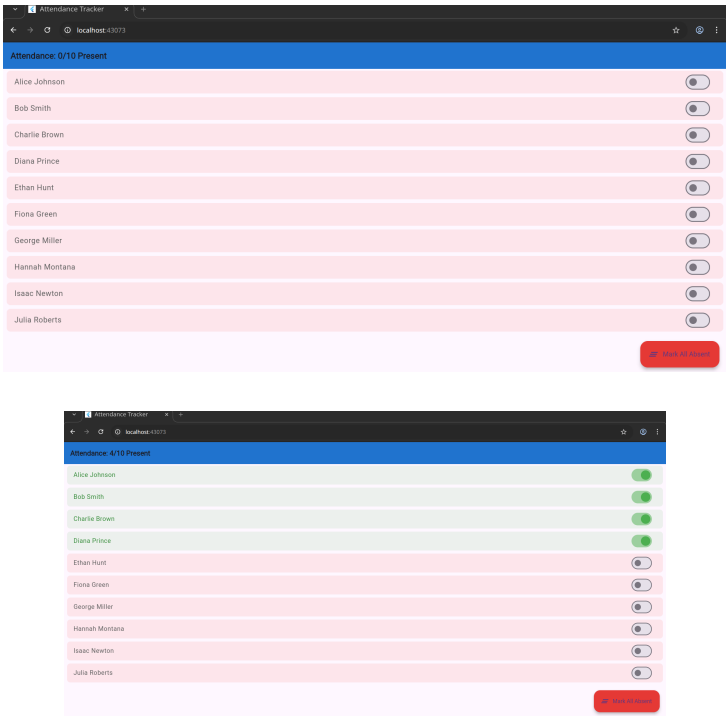


Figure 1: Main APP