ROYAL UNIVERSITY OF BHUTAN
COLLEGE OF SCIENCE AND TECHNOLOGY
PHUENTSHOLING: BHUTAN

PLAGIARISM DECLARATION FORM

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Module No and Title of the module: CTE306 - Mobile Application Development
Assignment no and Title of the Assignment: Lab Wok 11

Section H2 of the Royal University of Bhutan's *Wheel of Academic Law* provides the following definition of academic dishonesty:

"Academic dishonesty may be defined as any attempt by a student to gain an unfair advantage in any assessment. It may be demonstrated by one of the following:

Collusion: the representation of a piece of unauthorized group work as the work of a single candidate.

Commissioning: submitting an assignment done by another person as the student's own work.

Duplication: the inclusion in coursework of material identical or substantially similar to material which has already been submitted for any other assessment within the University.

False declaration: making a false declaration in order to receive special consideration by an Examination Board or to obtain extensions to deadlines or exemption from work.

Falsification of data: presentation of data in laboratory reports, projects, etc., based on work purported to have been carried out by the student, which have been invented, altered or copied by the student.

Plagiarism: the unacknowledged use of another's work as if it were one's own.

Examples are:

- verbatim copying of another's work without acknowledgement
- paraphrasing of another's work by simply changing a few words or altering the order of presentation, without acknowledgement
- ideas or intellectual data in any form presented as one's own without acknowledging the source(s)
- making significant use of unattributed digital images such as graphs, tables, photographs, etc. taken from test books, articles, films, plays, handouts, internet, or any other source, whether published or unpublished
- submission of a piece of work which has previously been assessed for a different award or module or at a different institution as if it were new work
- use of any material without prior permission of copyright from appropriate authority or owner of the materials used"

Student Declaration

I confirm that I have read and understood the above definitions of academic dishonesty. I declare that I have not committed any academic dishonesty when completing the attached piece of work.

Signature of Student: Divyash Chhetri

Date: 14 Oct 2022

Lab 11

CTE306 – Mobile Application Development

Date – 11th October 2022

Divyash Chhetri
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BE 3 IT

Module Tutor: Mr. Pema Galey

Department of Information Technology
College of Science and Technology

Aim
Design Question Answer Application Using Flutter

Instructions
Perform the task on following topics:

1. Write Flutter/Dart from Scratch
2. Create Q&A App
3. Replace ***main.dart*** and copy ***other dart files*** with attached files

Theory
The Flutter framework includes a software development kit (SDK) as well as a widget-based user interface library. Sliders, buttons, and text inputs are among the reusable UI elements in this package. Developers working with the Flutter framework will use the Dart programming language to create mobile apps. Dart is a structured object programming language that concentrates on front-end development, with a syntax similar to JavaScript.

Flutter is used by Google for a number of Google Assistant modules as well as the Google Home Hub user interface. Furthermore, there are currently 50,000 Flutter apps available in the Google Play Store, with the number rapidly increasing. Flutter is used by Alibaba Group, eBay, Groupon, and other well-known e-commerce companies to provide their web and mobile applications a consistent aesthetic. "Our aim for Flutter is something most of us have been dreaming of for years – a strong, general-purpose, open UI toolkit for designing amazing experiences on any device-embedded, mobile, desktop, or beyond," says Tim Sneath, Group Product Manager at Google.

q_and_a_app

Program Code

main.dart

```dart
import 'package:flutter/material.dart';
import './quiz.dart';
import './result.dart';

void main() => runApp(
      const MyApp(),
    );

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

  @override
  State<StatefulWidget> createState() {
    return MyAppState();
```

```
  }
}

class MyAppState extends State<MyApp> {
  final _questions = const [
    {
      'questionText': 'Capital of Finland is _________',
      'answers': [
        {'text': 'Helsinki', 'score': 10},
        {'text': 'Tokyo', 'score': 0},
        {'text': 'Cairo', 'score': 0},
        {'text': 'Tehran', 'score': 0},
      ],
    },
    {
      'questionText': 'When was flutter released?',
      'answers': [
        {'text': '2020', 'score': 0},
        {'text': '2019', 'score': 0},
        {'text': '2018', 'score': 10},
        {'text': '2017', 'score': 0},
      ],
    },
    {
      'questionText': 'Who is the father of computer?',
      'answers': [
        {'text': 'Bill Gates', 'score': 0},
        {'text': 'Charles Babbage', 'score': 10},
        {'text': 'Elon Musk', 'score': 0},
        {'text': 'Alan Turing', 'score': 0},
      ],
    }
  ];

  var _questionIndex = 0;
  var _totalScore = 0;
  void _resetQuiz() {
    setState(() {
      _questionIndex = 0;
      _totalScore = 0;
    });
  }

  void _answerQuestion(int score) {
    _totalScore += score;
```

```
    setState(() {
      _questionIndex = _questionIndex + 1;
    });
  }

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      home: Scaffold(
        appBar: AppBar(
          title: const Text('Quiz App'),
        ),
        body: SafeArea(
          child: _questionIndex < _questions.length
              ? Quiz(
                  answerQuestion: _answerQuestion,
                  questionIndex: _questionIndex,
                  questions: _questions,
                )
              : Result(_totalScore, _resetQuiz),
        ),
      ),
    );
  }
}
```

answer.dart

```
import 'package:flutter/material.dart';

class Answer extends StatelessWidget {
  final Function selectHandler;
  final String answerText;
  const Answer(this.selectHandler, this.answerText, {super.key});

  @override
  Widget build(BuildContext context) {
    // ignore: sized_box_for_whitespace
    return Container(
      width: double.infinity,
      margin: const EdgeInsets.fromLTRB(50, 5, 50, 5),
      child: ElevatedButton(
        style: ElevatedButton.styleFrom(
          foregroundColor: Colors.white,
          backgroundColor: Colors.blue,
```

```
        ),
        onPressed: (() => selectHandler()),
        child: Text(answerText),
      ),
    );
  }
}
```

question.dart

```
import 'package:flutter/material.dart';

// ignore: must_be_immutable
class Question extends StatelessWidget {
  final String questionText;

  const Question(this.questionText, {super.key});

  @override
  Widget build(BuildContext context) {
    return Container(
      width: double.infinity,
      margin: const EdgeInsets.fromLTRB(15, 50, 15, 30),
      child: Text(
        questionText,
        style: const TextStyle(fontSize: 25),
        textAlign: TextAlign.center,
      ),
    );
  }
}
```

quiz.dart

```
import 'package:flutter/material.dart';
import './answer.dart';
import './question.dart';

class Quiz extends StatelessWidget {
  final List<Map<String, Object>> questions;
  final Function answerQuestion;
  final int questionIndex;

  const Quiz({
    super.key,
```

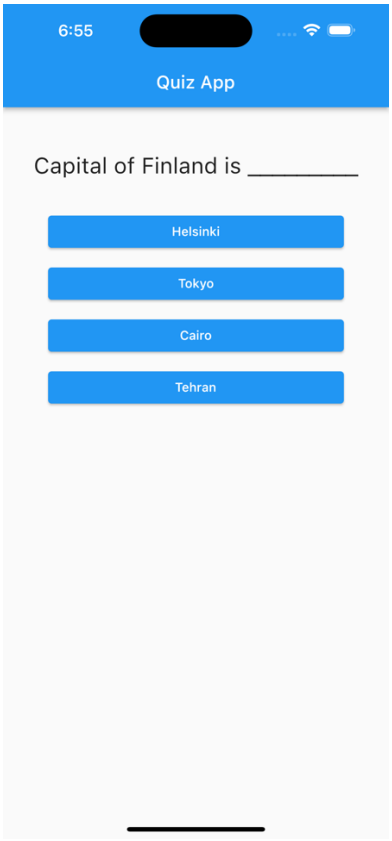
```
    required this.answerQuestion,
    required this.questions,
    required this.questionIndex,
  });

  @override
  Widget build(BuildContext context) {
    return Column(
      children: [
        Question(
          questions[questionIndex]['questionText'].toString(),
        ),
        ...(questions[questionIndex]['answers'] as List<Map<String,
Object>>)
            .map((answer) {
          return Answer(
              () => answerQuestion(answer['score']),
answer['text'].toString());
        }).toList()
      ],
    );
  }
}
```

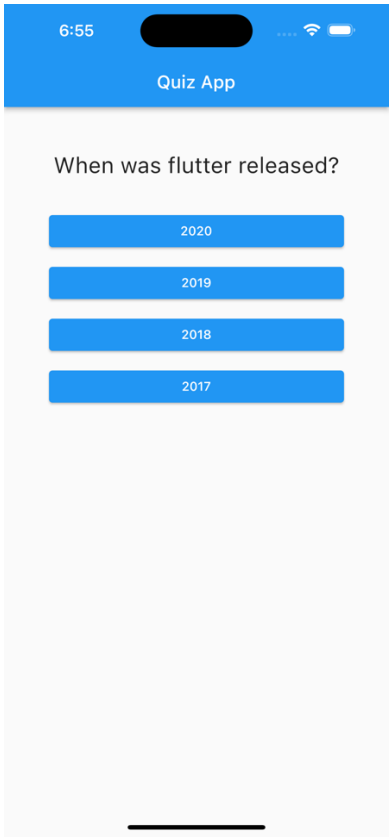
result.dart

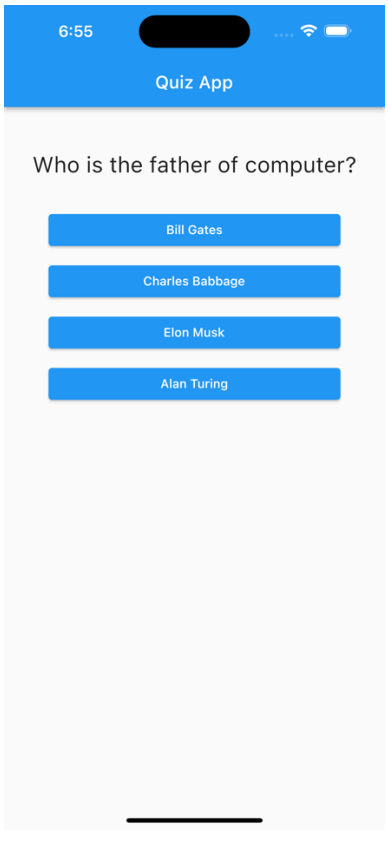
```
import 'package:flutter/material.dart';

class Result extends StatelessWidget {
  final int resultScore;
  final Function resetHandler;
  // ignore: prefer_const_constructors_in_immutables
  Result(this.resultScore, this.resetHandler, {super.key});

  String get resultPhrase {
    String resultText;
    if (resultScore == 30) {
      resultText = 'We should be friend!';
    } else if (resultScore == 20) {
      resultText = 'Getting there try again!';
    } else {
      resultText = 'Get Help';
    }
    return resultText;
  }
```

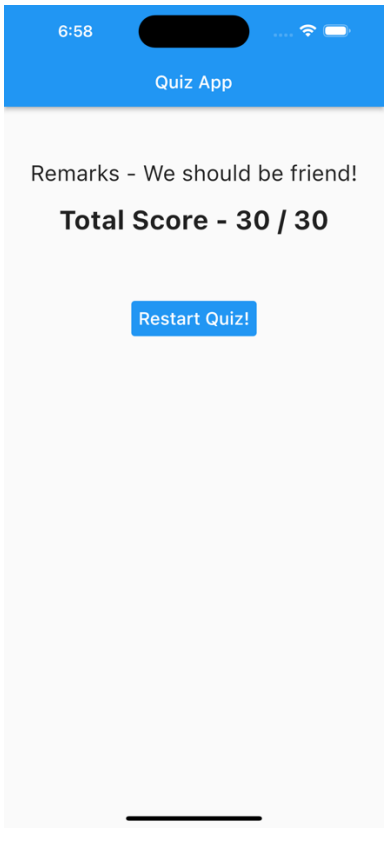
```
  @override
  Widget build(BuildContext context) {
    return Center(
      child: Column(
        children: <Widget>[
          const SizedBox(
            height: 10,
          ),
          Container(
            margin: const EdgeInsets.fromLTRB(15, 50, 15, 10),
            child: Text(
              "Remarks - $resultPhrase",
              style: const TextStyle(
                fontSize: 25,
              ),
              textAlign: TextAlign.center,
            ),
          ),
          Container(
            margin: const EdgeInsets.fromLTRB(15, 10, 15, 70),
            child: Text("Total Score - $resultScore / 30",
                style: const TextStyle(
                  fontSize: 30,
                  fontWeight: FontWeight.bold,
                ),
                textAlign: TextAlign.center),
          ),
          TextButton(
            onPressed: (() => resetHandler()),
            style: TextButton.styleFrom(
                foregroundColor: Colors.white, backgroundColor:
Colors.blue),
            child: const Text('Restart Quiz!',
                style: TextStyle(
                  fontSize: 20,
                )),
          )
        ],
      ),
    );
  }
}
```

Output


6:55
Quiz App
Capital of Finland is _____
Helsinki
Tokyo
Cairo
Tehran


6:55
Quiz App
When was flutter released?
2020
2019
2018
2017


6:55
Quiz App
Who is the father of computer?
Bill Gates
Charles Babbage
Elon Musk
Alan Turing


6:58
Quiz App
Remarks - We should be friend!
Total Score - 30 / 30
Restart Quiz!

Conclusion

Through the practical I learned that Flutter can be used to make applications that can run on both the Android OS and iOS. Creating buttons and making it responsive was also learned in this practical. Flutter was made available as an open-source framework for creating Android and iOS apps. The Dart programming language is used to create the Flutter framework, which includes the Flutter engine, Foundation library, and widgets. The whole user interface may be created by simply mixing different widgets. Widgets are divided into two categories. Stateless Widgets are widgets that do not change, i.e., their look and characteristics do not change during the widget's lifespan. Stateful Widgets, on the other hand, are dynamic widgets that modify their attributes during runtime.

References

Android. (n.d.). *Android Studio Docs*. Retrieved 2022, from Developers Android: https://developer.android.com/docs

Thomas, G. (2021, July 09). *What is Flutter and Why You Should Learn it in 2020*. Retrieved Oct 11, 2022, from Freecodecamp: https://www.freecodecamp.org/news/what-is-flutter-and-why-you-should-learn-it-in-2020/

Flutter. (n.d.). *macOS install Flutter*. Retrieved Oct 11, 2022, from Flutter: https://docs.flutter.dev/get-started/install/macos