

**CoderQuiz: An Android based Programming Quiz Application**

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This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering

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**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

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## **APPROVAL**

This Project titled **CoderQuiz: CoderQuiz: An Android based Programming Quiz Application**, submitted by Farjana Tasnim and Md. Esarot Hossain Sakib to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **October2020**.

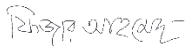
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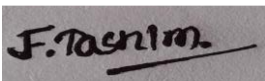
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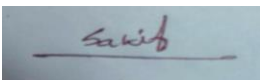
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## **ABSTRACT**

In today's world, we can't imagine our life without digital gadgets. Gadgets are simply changed our day today's lives and thereby saving our time too .Smartphone is one of these gadget which have become an essential part of our life and make simpler our routine work. A smartphone with an Android OS and IOS offers outstanding functionality with admirable services to the users. Android users can easily track their routine work and fulfill the work by their smartphone. So we developed an android quiz application with flutter framework which can be a learner's favorite app for learning with time limit. In this quiz app the questions are categories 'with different topics. After taking part of this quiz question will be given by multiple choice with time limit and marks are generate by the apps automatically.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

This project is about an android application which is developed with Flutter framework. Nowadays, smartphone have become a part of our daily life. It has the specialty to simplify user's task. It accomplish user's requirement and also gives a platform that soothe administrative work. Android OS smartphone is free and an open source software that give users more confident to use it and because of these accessibility it become the most popular using OS to the users.

A survey has done by "Light Castle Partners" which indicates that the majority users are Android OS though there are other OS mobile users exist [1].

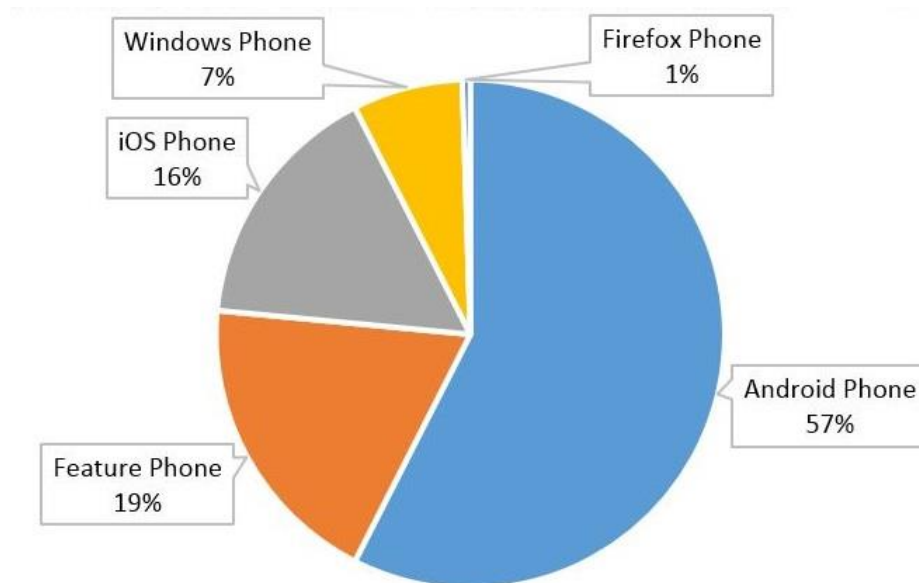


Figure 1.1: Survey result by 'LightCastle' on different smartphone OS.

In this circumstance, Project application should develop based on android platform. We define our application as '**CoderQuiz**' which is a quiz application where users can participate for MCQ quiz with their android OS and iOS based smartphone. In this

project admin can add, delete and also edit user interface (UI). The prime goal of this project is to take online quiz for any individuals and give users the facilities of user friendly configuration to both android OS and iOS.

## **1.2 Motivation**

As the android briskly getting popular day by day and the number of its users are growing with every blink of eyes, because android based applications are easy to access with smartphones. Therefore we attempt to build this project which can easily manage, time saving and more efficient than any other apps. In playstore there are many applications are available but most of the applications are for fun and entertainment. So we decide to build an app with learning approach. We all are well known about paper based test which is time consuming and costly process, because of this reason we thought about a quiz test in which users can take participate from anywhere and test their knowledge about programming language without faced any difficulties.

## **1.3 Objectives**

The goal of this project is to develop an application named '**CoderQuiz**' which can avoid paper based test circumstances and provide an easy and problem free quiz test about programming languages. The goal of proposed project is given below:

- To have an easy access to our app users must be use Android OS.
- To any individual can take quiz from anywhere
- To reduces manual effort and provide an easy and user friendly environment
- To test users Programing knowledge anytime
- To modify system Admin can add, delete, edit question database and UI
- To generate result score based on user performance.

## **1.4 Expected Outcome**

CoderQuiz is a platform that will provide a facility to take participate on quiz without any paper based exam requirements. User can easily enter the application and take part of quiz with their chosen category.

With our project a user can take part and test their programming knowledge without any difficulty. They can choose different category and enrich their programming knowledge basic to high level. And it saves time and cost too.

### **This application has some following features:**

- User can easily take part to the quiz with any android device
- User can choose any category and participate the test
- The question pattern is MCQ with limit of time
- There is no extra requirement for taking the exam
- After completing exam user can see result score based on answering question

## **1.5 Report Layout**

We divide our report layout into 6 different chapters. Each individual chapter will describe the different contexts of this project.

### **Chapter 1: Introduction**

In introduction chapter we will discuss about introduction, Objectives, motivation, and expected outcome.

### **Chapter 2: Background**

Background cases about our project will discuss here. Related work, Comparative studies, and scope of problem and challenges we face.

### **Chapter 3: Requirement Specification**

This chapter is consists of Business process model, requirement collection, use case diagram, and design requirements for our project.

#### **Chapter 4: Design Specification**

This chapter is consists of our project design, interaction design and UX and also implementation requirements.

#### **Chapter 5: Implementation and Testing**

This chapter is consists of design, Implementation of Database, User Acceptance testing, and Scope of further Developments.

#### **Chapter 6: Conclusion and Future Scope**

In this last chapter we will discuss about conclusion and future scope of our application.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

CoderQuiz is an online quiz application for both android OS and iOS user. In this chapter we include every details and comparative analysis of our work. Scope of the application and challenges that we faced are explained in this chapter.

#### **2.2 Related Works**

In Playstore, there are many applications for one way or other related to quiz purpose; however, there is only some application that helps in learning. Most of available applications are for gaming and fun purposes. So we organize our application with necessary learning purposes which helps to test knowledge and contributes to the programming enhancement to users.

#### **2.3 Comparative Studies**

In recent time, there are many application with popular view is available in online. As like QuizUp, Trivia Quiz, 3in1 Quiz, 95% apps are very popular quiz apps based on android OS. These quiz apps are used for fun and gaming purposes. People always like to play games on their free time. But people who are truly wanted to learn something about programming knowledge even in their free time then ‘CoderQuiz’ can be their first choice. This application can completely use for learning purposes. Users can participate and practice their knowledge with time limit. This is time saving and efficient for any organizational test.

#### **2.3 Scope of problems**

We have been working on our project following the android application development process. It’s difficult for us to make a different application which is a quiz system based on android. This is helpful for the users of the application to test their skills and also institutes are able to take quizzes through the application. It took a long time in deciding

the theme and the purposes of the project and collecting requirements and gathered information extensively.

## **2.4 Challenges**

There are some quite similar apps so we had to come up with incipient conceptions which will make our application unique and user-friendly that was the most challenging part for us. We were newcomers in android development and also the new framework of Dart language. That's why firstly we faced some difficulties in the android studio environment. To design the UX and implementation with this process was so difficult with a new environment.

# CHAPTER 3

## REQUIRMENT SPECIFICATION

### 3.1 Business Process Model

Business process model is the analytical representation or an illustration of an organization's business process and system engineering enables building, analyzing, and managing a system so the process can analyzed, modified, and automated.

Here is our applications Business process model which is combined with two part, user and application. The BP model is given below:

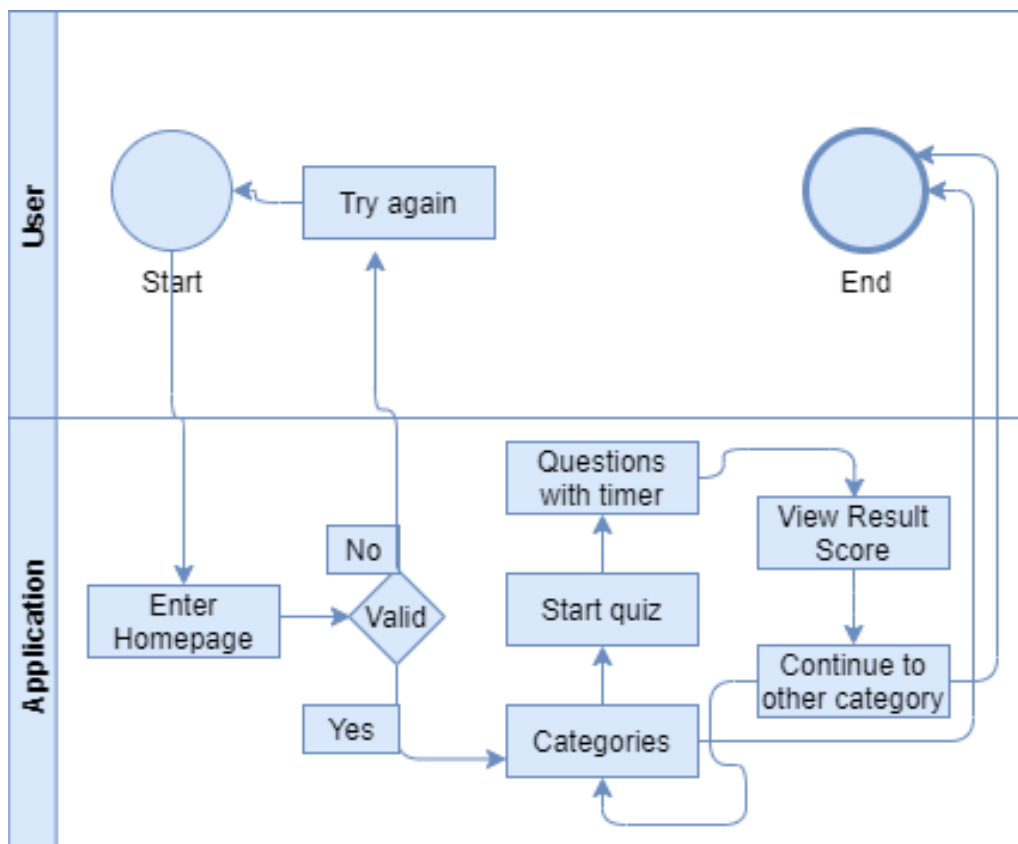


Figure 3.1 Business Process Model



### 3.2 Requirement Collection and Analysis

It's the early step of the procedure for resolving, documenting, and managing stakeholder needs & requirements to meet project goal. It's a critical part of any software development project but good user requirement can lead to better estimate, improved customer satisfaction, reduced cost and shorter the time duration.

### 3.3 Requirement for Application

In order to progress our application, we had to collect requirements that can help to complete our application smoothly. There are different kinds of requirement collection techniques that we used for gathering requirements and analysis as questionnaires and surveys, read documents, group discussions. And then design in a way that helpful and can solve problems is an efficient way.



Figure 3.3 Requirement of Application

### 3.4 Use Case Modeling and Description

Use case itself a powerful technique that represents the required actions to enable or abandon a goal. Use case modeling is an important step for any underdeveloped project. It's easy to understand and provide an excellent way of communicating with customers and users.

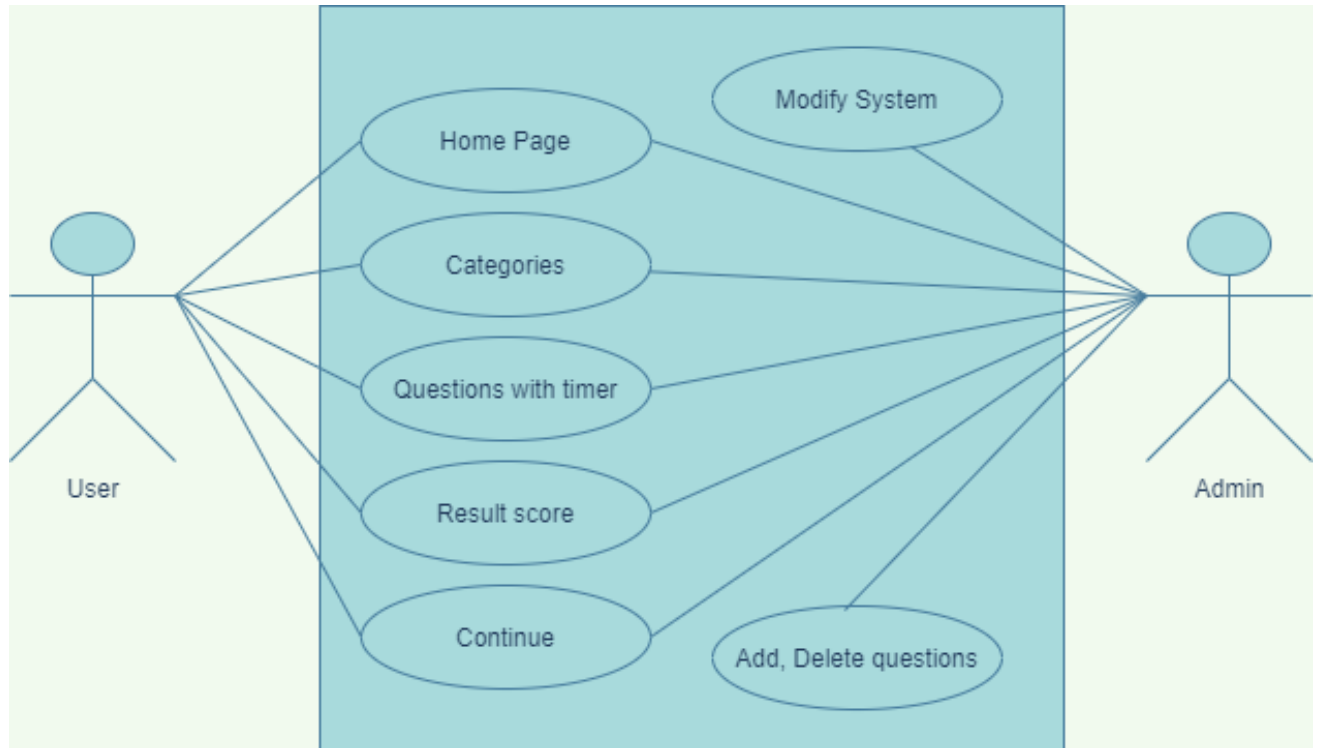


Figure 3.4 Use Case Modeling

#### I. Homepage

**Brief Description:** This is the first step to enter the application.

**Actor:** User

#### II. Category page

**Brief Description:** User can select different topic from category.

**Actor:** User

#### Steps

- a) After enter to the system user can choose any category.

- b) User can select any category which are available

### **III. Questions with timer**

**Brief Description:** User can see the questions here and take participate.

**Actor:** User

#### **Steps**

- a) In this step user will select category for participating in the test.

### **IV. Result score**

**Brief Description:** After answering the entire question from a certain category user can see the result score.

**Actor:** User

#### **Steps**

- a) This step will start after answering the entire question.
- b) After completing the exam user and admin both can see the final score

### **V. Continue**

**Brief Description:** After completing exam user can go to the other category using Continue to next level/start with previous one.

**Actor:** User

#### **Steps**

- a) This step will start when user pass/fail the previous level after answered one category.

## **3.5 Entity Relationship Model**

Entity relationship model is describing the concept of the system using entities. Here in our application we describe how a user can use all the entities of Homepage, Category, Quiz page and Result score.

The ER diagram is given below:

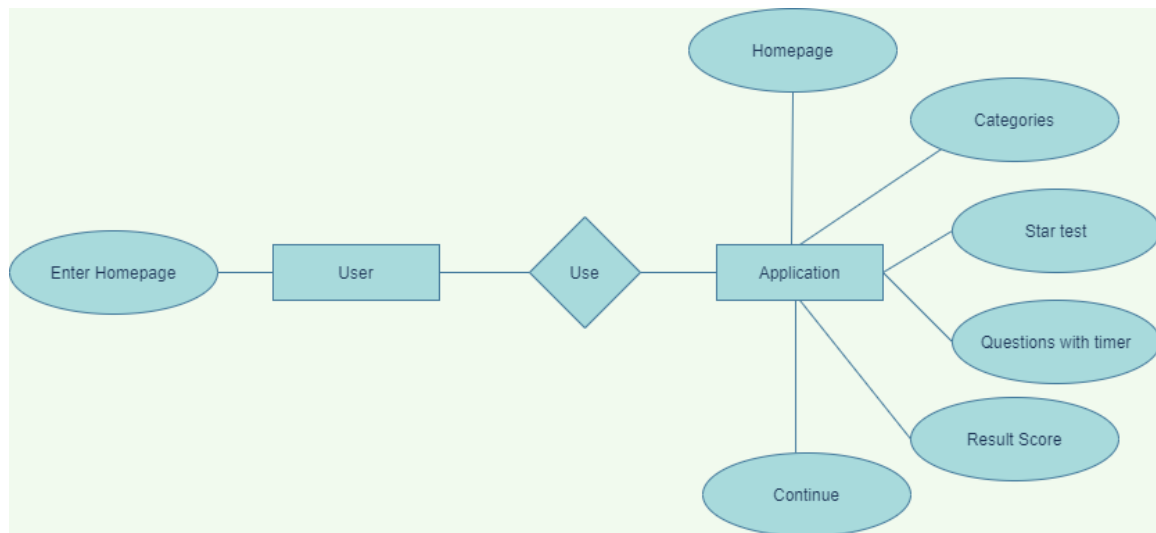


Figure 3.5 ER Diagram

### 3.6 Design Requirements

Design requirements state the important features of project design that must meet in order to be successful. There are a few examples of design requirements that need to keep in mind while developing a project.

**User Requirement:** User requirements often referred to as the primary input for designing system requirements. It mentioned user needs; describe the user expectations about the system, such as what activities users must be able to perform. Its need to be develops such a way that easy to use and maintain.

**Performance Characteristics:** A Performance characteristic is a test of a project that used to describe its `quality, accuracy, precision, resolution, analytical sensitivity etc.

**Cost target:** A cost target is always a design requirement. It presents a baseline to make the decision of the product development process. It included with the cost of purchase, cost to use and also cost to repair.

**Manufacturing Considerations:** The knowledge of the manufacturing process is of great importance for designing a project with the goal of making it easy to manufacture. The major objective of manufacturing is to assure both the quality and productivity of a project.

## CHAPTER 4

### DESIGN SPECIFICATION

**4.1 Front-end Design:** It's an essential and most superficial layer of an app that users can see and interact with and is made of images, objects etc. The prime goal of designing a project that keeps users' attention after entering the site. Front end includes all software or hardware that makes up a user interface. Simplicity is the best part of creating any interface. Thus we kept our project simple, unique and user friendly.

#### **Home page**

When any user enters our application he/she can see this page first. Homepage screenshot is given below:



Figure 4.1(i) Home page of our application

### Category page

After entering to the Home page user automatically moved to the 2<sup>nd</sup> page which is define as our Category page of the application.

Here the categories of our application which is given below:



Figure 4.1(ii) Categories of our application

### Quiz page

After choosing a category by the users of their interested area, user can take participate the quiz. The question will be provided by the pattern of multiple choices and also include a timer which will swap the question after reaching the given time limit.

The screenshot of quiz page with timer is given below:

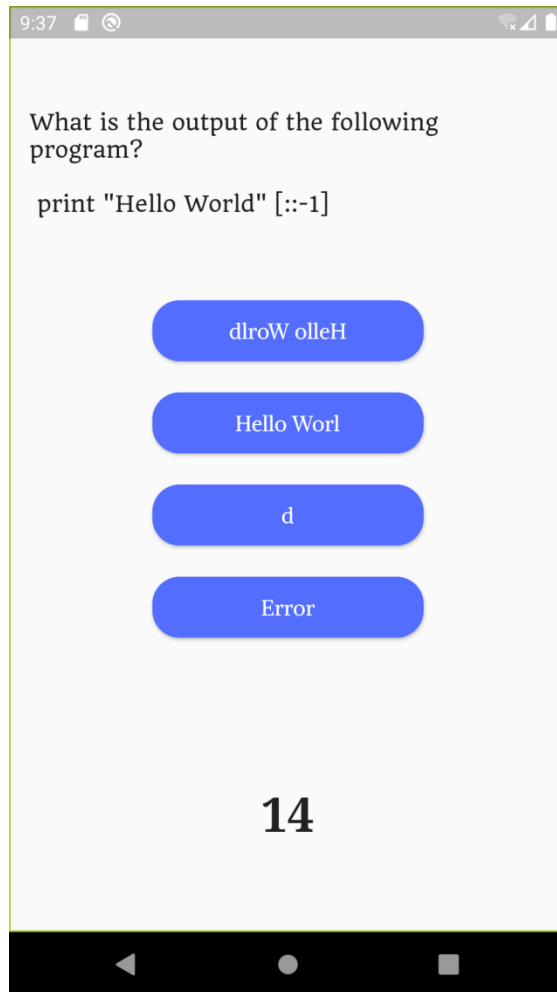


Figure 4.1(iii) Quiz page of our application

### **Result score page**

After answering the entire question of quiz page, participant can see the result based on their performing score.



Here is the Result score page of our application which is given below:

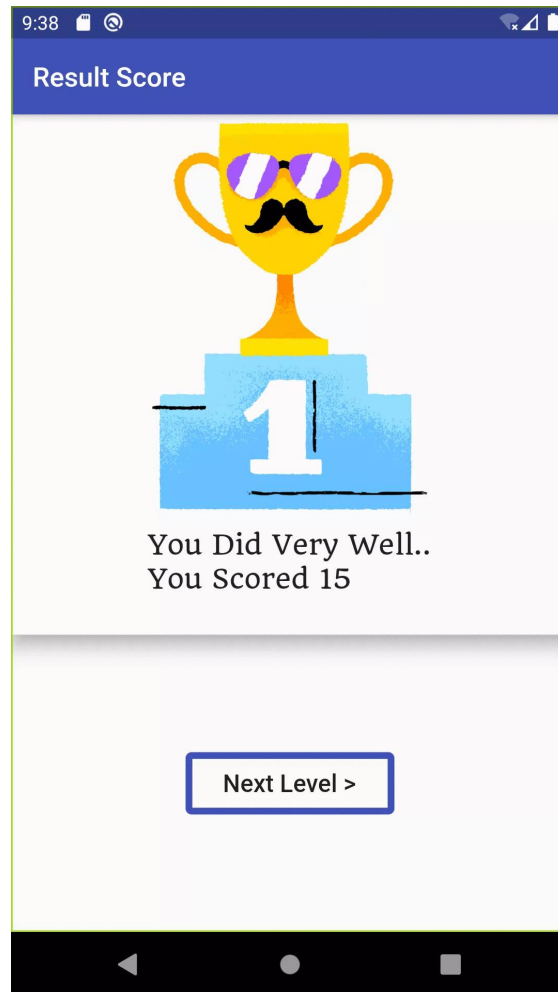


Figure 4.1 (iv) Result score page of our application

### **Next Level**

Based on result score user can enter to the next level and take participate for the intermediate question answer.

Here is the Result score page of our application which is given below:

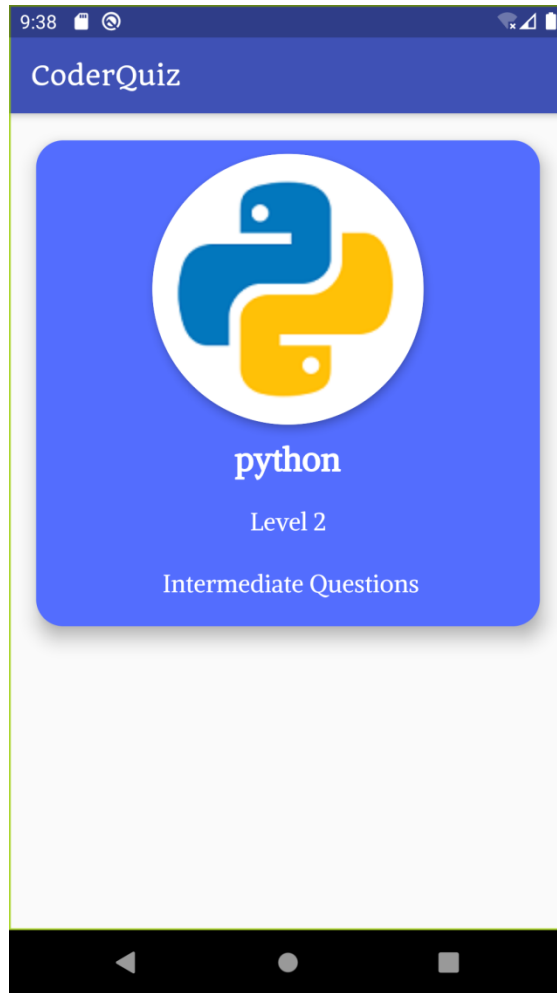


Figure 4.1 (v) Next Level page of our application

### **Next level Quiz Page**

After entering Intermediate questions level user have to answer the entire question. The question includes with time limit.

Here are the screenshot for intermediate question level:

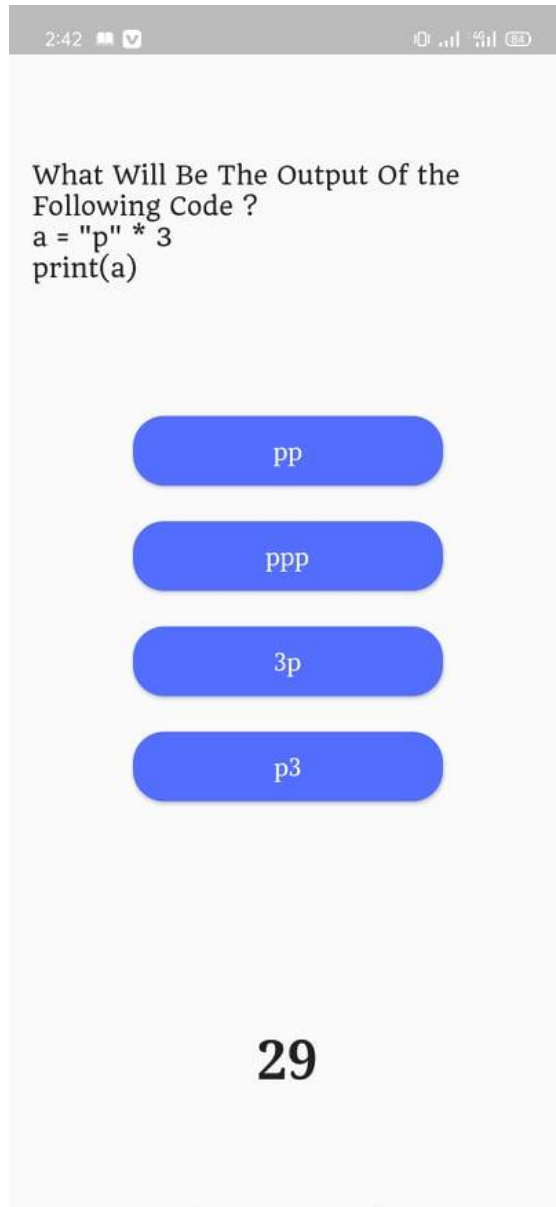


Figure 4.1 (vi) Question page of our application

## Result score of Next Level

After completing quiz user can see this result score page which is given below:

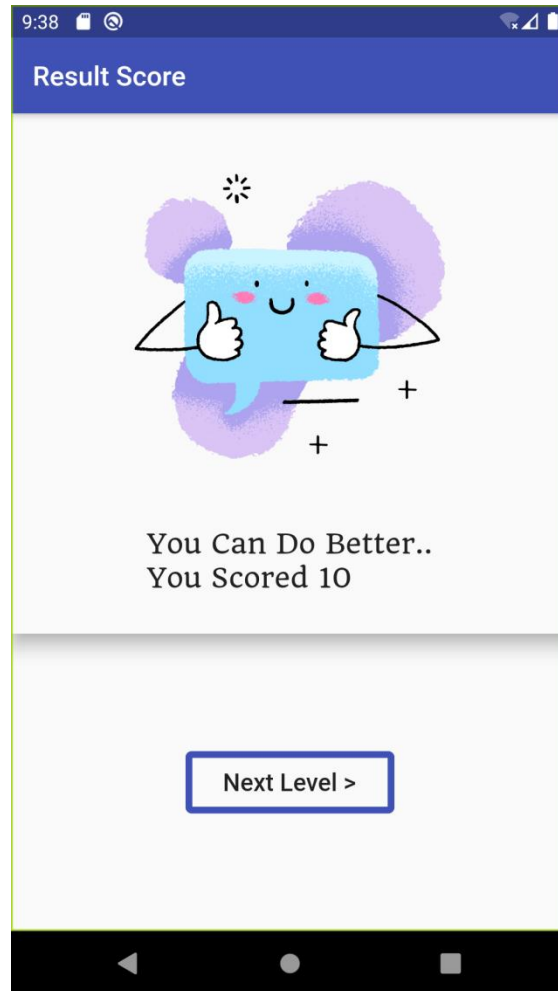


Figure 4.1 (vii) Result score page of our application

## 4.2 Back-end Design

You can design the most beautiful crafted app, you can have the most innovative mobile business idea but in the end, if the foundation of your work doesn't work, the application will be a failure.

The solid work of a good back-end is the key to a good front-end experience. The back-end makes its entrance into the app in order to give life to the front-end. The part of the back-end remains hidden to users but not to the admin or developers.

### 4.3 Interaction Design and UX

It is the layout of an interaction for both users and products. It's a part of an UX design. Interaction focuses on the movement when users interact with the products and their goal is to improve the interactive experience.

User experience (UX) is a process that uses to create products that provide meaningful and relevant experiences for the users.

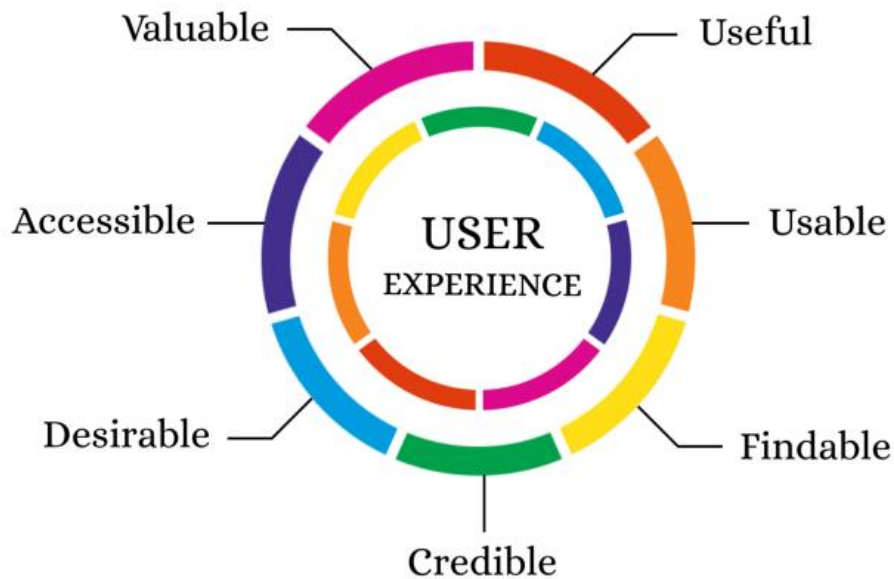


Figure 4.3 User Experience (UX)

### 4.4 Implementation Requirements

Implementation is the action that must be follow any preliminary plans in order for something that actual happen. In this system we fulfill the implementation requirements to complete our application.

For complete our application we needed to use these implementation tools which is given below:

**Android studio:** Android studio is currently the most widely used IDE which provide new tools for every type of android app development. Here, we use android studio for our application.

**Flutter Framework:** Flutter is the free and open source Google's UI toolkit that provides a fast and artistic way for crafting beautiful native apps on both IOS and Android. We used flutter as our framework for our application.

**Dart Language:** Flutter framework uses dart language which client-optimized for fast apps on multiple platforms. It's an object oriented, class based language with C-style syntax.

**Emulator:** The emulator simulates Android device on computer to test an application on a variety of devices and Android API level without any physical device. The emulator provides about all the capabilities of a real Android device.

#### **4.5 System Requirements for run the application:**

- Android device
- Operating System version : Up to Android 4
- Random Access Memory: 512MB

#### **4.6 Hardware Requirements**

- Microsoft Windows 7/8/10 (64-bit)
- 8GB RAM recommended for Android studio
- Minimum space on disk 2GB, 4GB is recommended
- Minimum screen resolution 1280\*800

# CHAPTER 5

## IMPLEMENTATION AND TESTING

### 5.1 Implementation of Database

In our project we use JavaScript Object Notation (JSON) as database where data synchronize in real time. All information about users is stored in this database. Admin can modify question and update rules & regulation.

Here is the screenshot of our database JSON how it is called in the .dart file is given below:

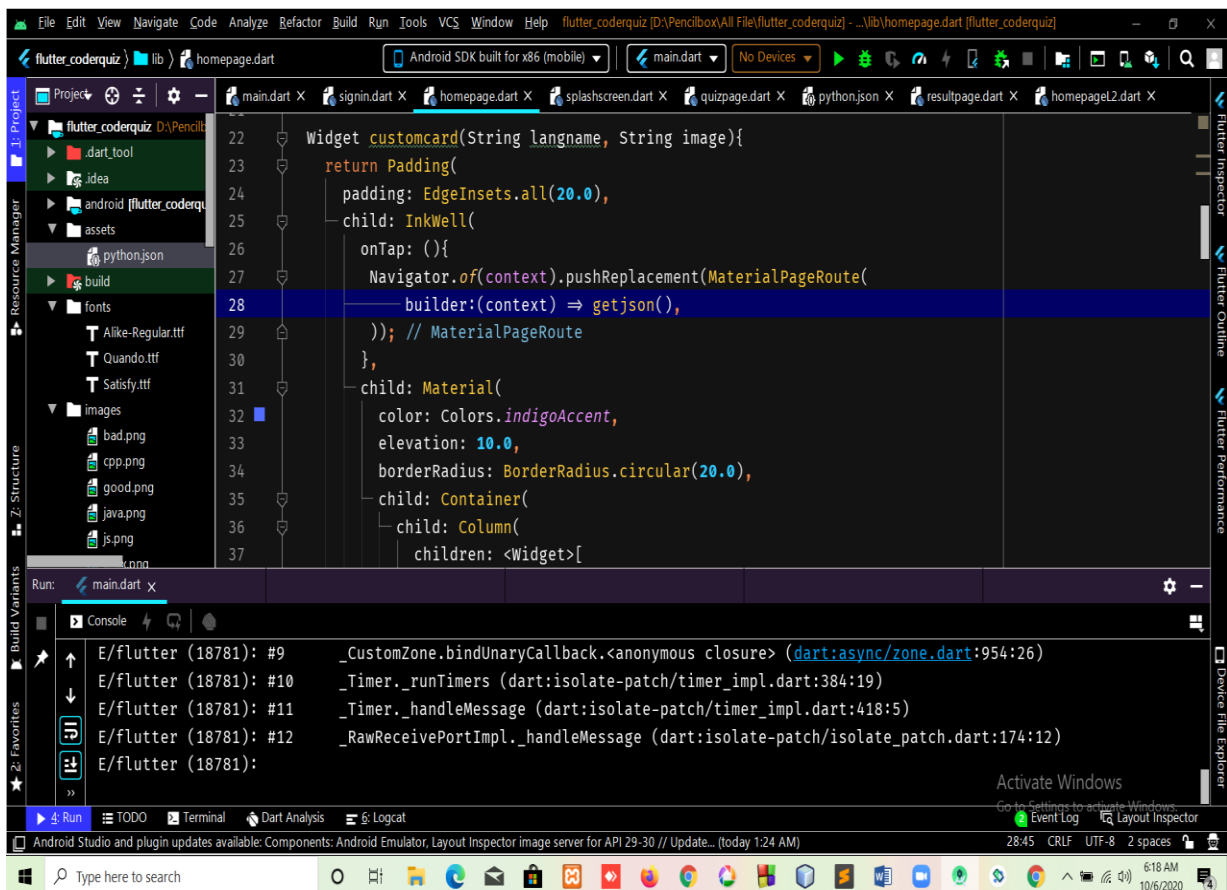


Figure 5.1 Screenshot of Database JSON

## **5.2 Implementation of Interactions**

Interaction is a kind of activity that occurs as two or more objects have an effect upon one another. It's a way of utilizing a physical input/output contrivance to perform a generic task. For a successful application we need to ensure user friendly applications that satisfy the user.

## **5.3 Testing Implementation**

Test implementation is the process where developing and prioritizing test procedure, creating test data and writing automated test scripts. After completing our application we test it few times. The factors we tested are given below:

- (1) Is applications database connection work properly?
- (2) Are users can enter homepage without difficulties?
- (3) Is all categories are work properly?
- (4) Provide questions correctly?
- (5) Is question timer work properly?
- (6) Is automated mark generator system work properly?

## **5.4 Test Results and Reports**

After completing our application we have test it quite a time and review if the application work perfectly. We test our application with different android phone check if it its really work or not, and its work!

The result of System Testing Table is given below:



Table 5.4 System Testing Table

Test case Id	Date	Tester	Pass/Fail	Test Data	Expected Result	Actual Result
1	15.09.2020	Rubel	Pass	Question answer	Successfully select answer	As Expected
2	15.09.2020	Sabbir	Pass	Selection of category	User can select any category	As Expected
3	15.09.2020	Riaz	Pass	Time limitation function	Question locked after given time	As Expected
4	15.09.2020	Emu	Pass	Database connection	Properly connected with application	As Expected
5	15.09.2020	Emu	Pass	Automated mark generator	Properly generate the mark	As Expected

### 5.5 User Acceptance Testing

Acceptance test determine the requirements of a specification or contract that are need to meet of any project. It involve with different kind of test like physical, chemical or performance tests.

The test cases for user acceptance test results are given below:

Table 5.5 User Acceptance Testing

<b>Test Case Id</b>	<b>Date</b>	<b>Tester</b>	<b>Pass/Fail</b>	<b>Test Data</b>	<b>Expected Result</b>	<b>Actual Result</b>
1	16.09.2020	Joy	Pass	Select category	Successfully selected	As Expected
2	16.09.2020	Amy	Pass	Answering question	Successfully answered all question	As Expected
3	16.09.2020	Munni	Pass	View result score	Viewed result score properly	As Expected
4	16.09.2020	Toma	Pass	Select another category	Successfully selected	As Expected
5	16.09.2020	Toma	Pass	Enter homepage	successfully Enter the application	As Expected

## **CHAPTER 6**

### **CONCLUSION AND FUTURE SCOPE**

#### **6.1 Discussion and Conclusion**

All praise due to Allah SWT, the merciful, we have successfully built our application after long-term of planning, discussion and implementation. The main purpose of our application is to develop an application that offers new aspects of learning and improving knowledge in programming area.

The theme of our quiz application is to provide user to learn and practice for programming tests that conducted basic to high level. Our application is useful for the preparation of any user who wants to enhance their programming knowledge.

CoderQuiz is the platform which is very useful and easy to take participates for the quizzes. It saves user times and money too unlike the paper based quiz test. An admin can handle all the procedure of the quiz application. With the help of this application a user can learn and practice anytime whenever they want.

#### **6.2 Scope of further Developments**

We are planning to keep managing and improve it for better requirement. Here is our plan to do in future:

- Add some more category
- Develop with iOS platform
- Add theoretical question part
- Make it more user friendly
- We'll try to improve its quality
- We'll work for online quiz application which will helpful for teacher and students

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## **APPENDIX**

There is a proverb says “Unity is strength . . . when there are teamwork and collaboration, wonderful things can be achieved. In order to accomplish our project, we had faced many difficulties. When we first start our work, we were so overweening and full of spirit, but after some days we felt undone as we were struggling about where to start. And when we find our goals and got our commencement point we were never looked back and keep moving forward. We were synchronized, completely we are in agreement and we kened our job well.

Whenever a crucial point came, we solved it simultaneously by group discussion. Determinately, after so many arduous and mass sleepless nights, we did this project prosperously.

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