Emerging Technologies

Android Programming

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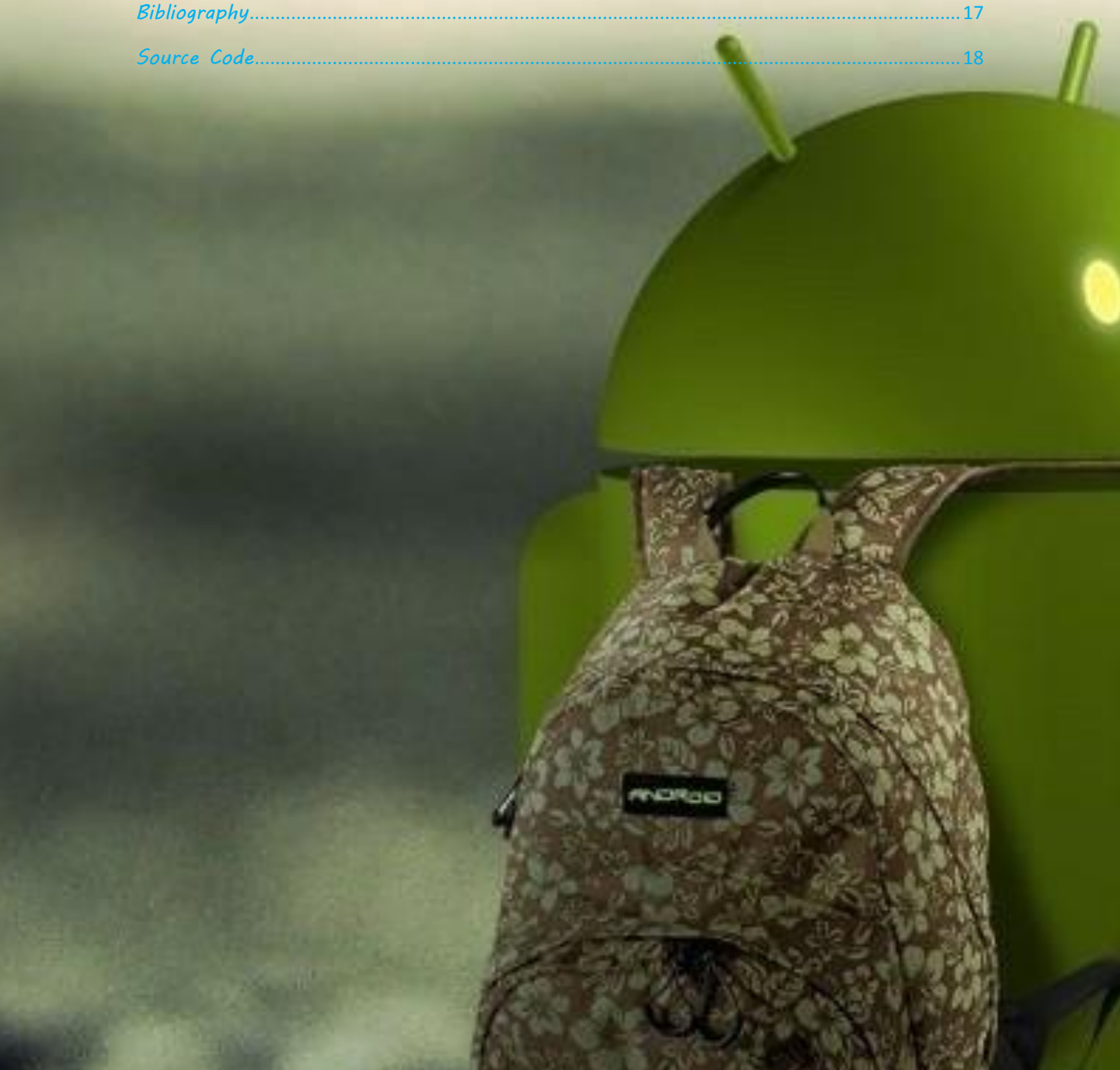
Contents



Introduction

The purpose of this document is to serve as a descriptive means of aiding in understanding process and methods that went into creating this Quiz Application.

For our 3rd year project, in Emerging Technologies, we are required to place the resources provided into a single workspace/module, and allow them to work collectively, whilst also creating an additional quiz topic.

The program lists 3 topics (History, Cars and Math), and the user is given 3 questions per topic to answer. The application accumulates the score and displays it to the user every time a different topic is completed.

GUI Screenshots have been provided to display how the program works. Relevant UML Diagrams have also been provided in order to show the logical order of the program.

Technologies Used

For the purpose of this project, Android Studio was used as the IDE for android programming. Android Studio was used because of the fact that I already had prior knowledge of this Studio and not Eclipse.

Within the Android Studio, the following additions were also used:

- Android SDK Tools
- Gradle Tools (Which comes with the Android Studio)

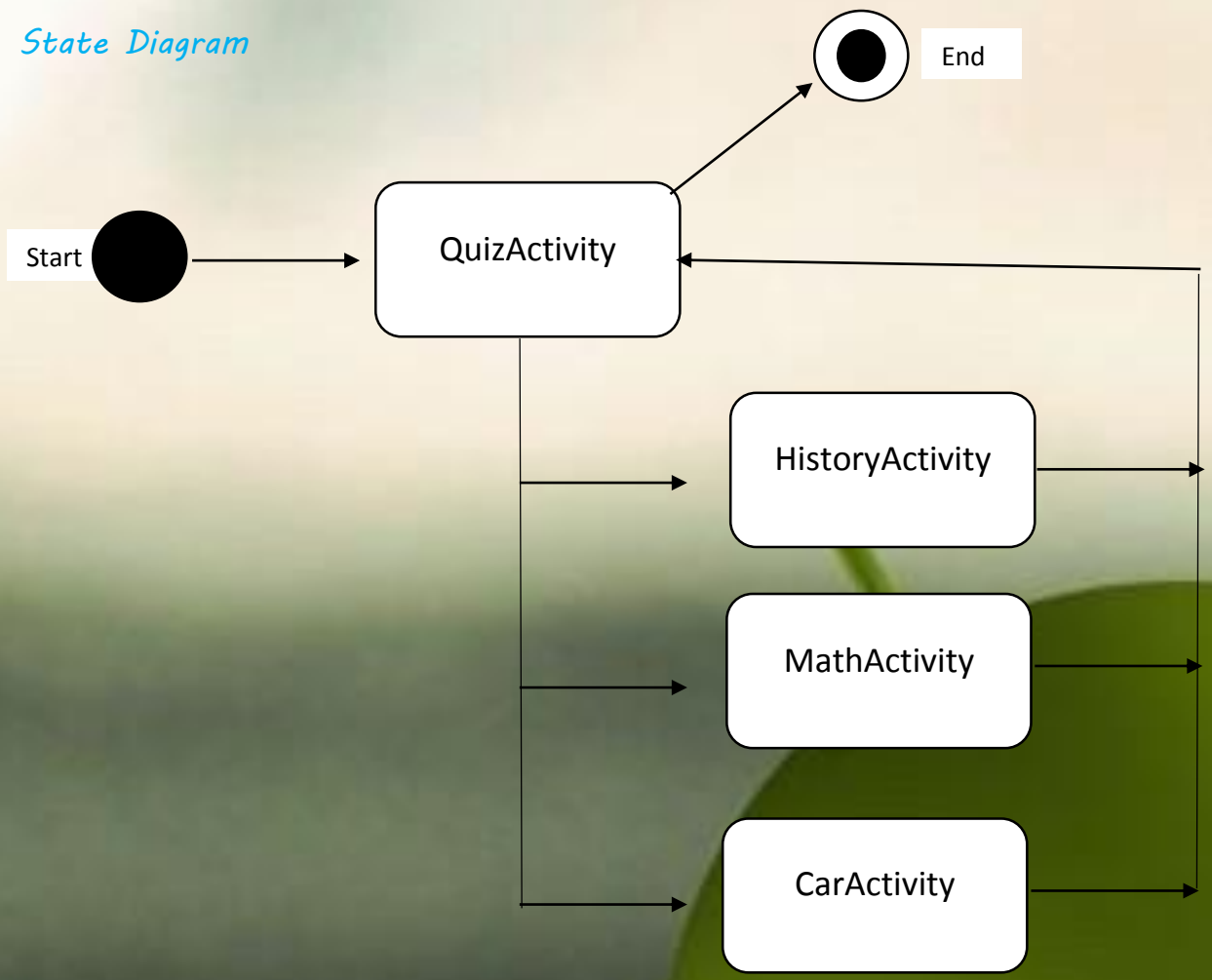
Microsoft Word 2013, was used as a word processing tool in order to create the documentation for this project.

Process followed

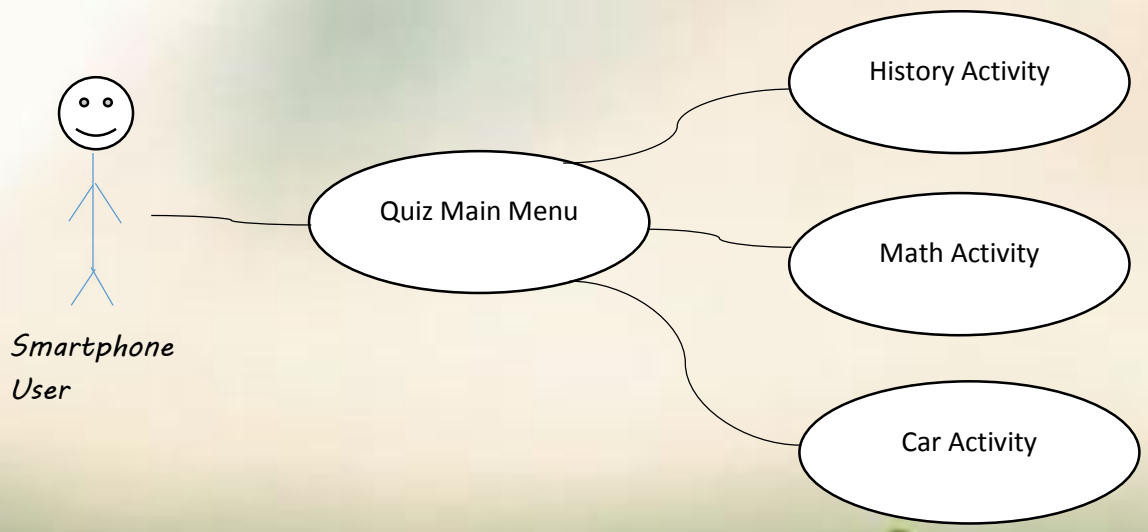
- The quiz activity (that was provided) was imported into a project called TejasQuiz
- A new device was created in the Android Virtual Device(AVD) Manager. This device was set to the following specifications:
    - AVD Name: GameDev
    - Device: Nexus S (4.0", 480x 800: hdpi)
    - Target: Android 4.4.2 - API Level 19
    - CPU/ABI: ARM(armeabi-v7a)
    - Keyboard: Hardware keyboard present
    - Skin: No Skin
    - Front Camera: None
    - Back Camera: None
    - Memory Options:
        - RAM: 343
        - VM Heap: 32
    - Internal Storage: 200 MiB
    - SD Card: 200 MiB
- Thereafter, the Device was loaded and started.
- The existing QuizActivity was loaded into the device, and tested to see if it operates
- MathActivity, MCOptions, and MultipleChoiceActivity were then also loaded into the module, and the interface was created for all three activies
- The code was then altered in order to integrate the accumulation of score for each activity
- Next a new Activity (Quiz) was created, which was called Car Activity. The code from the History Activity (MultipleChoice) was used for this new Car Activity, as they both use the same structure in terms of multiple choice questions and answers
- The program was then rebuilt and resynced and then execute through the emulated device
- Then the application was exported to an .apk file for ease of use and testing on actual mobile phones

Diagrams

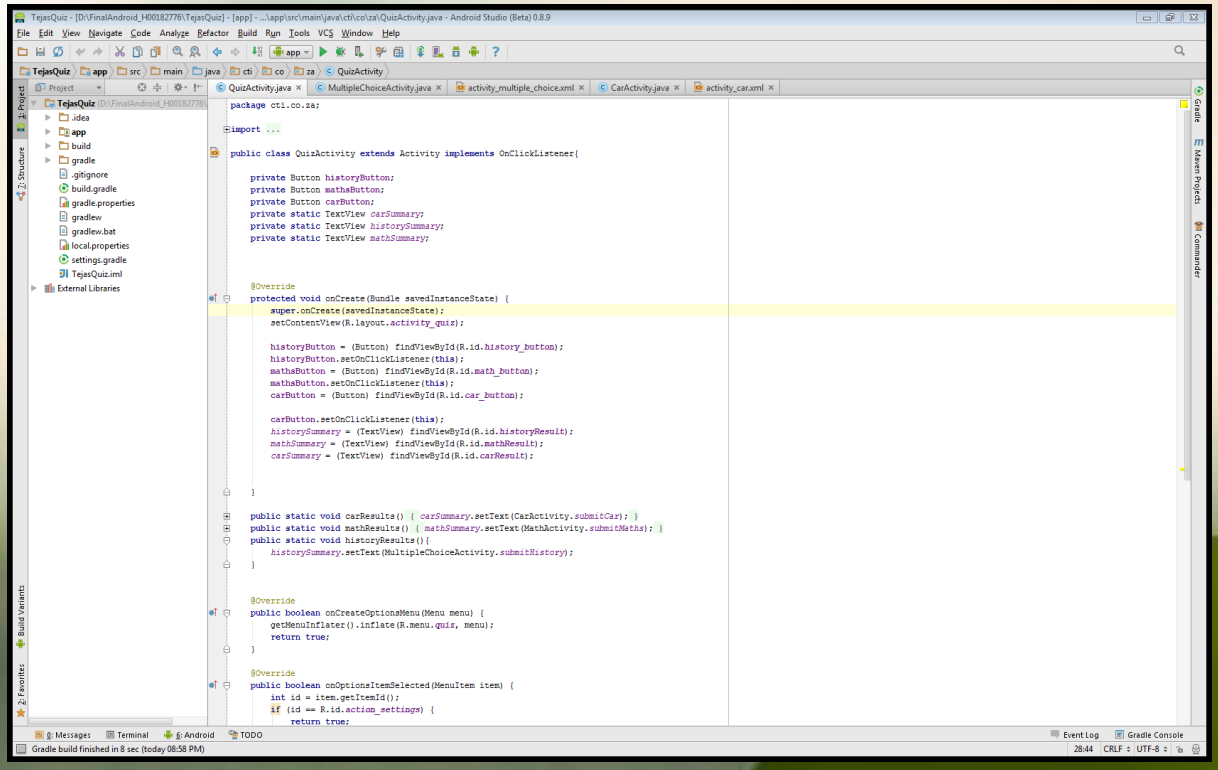
State Diagram



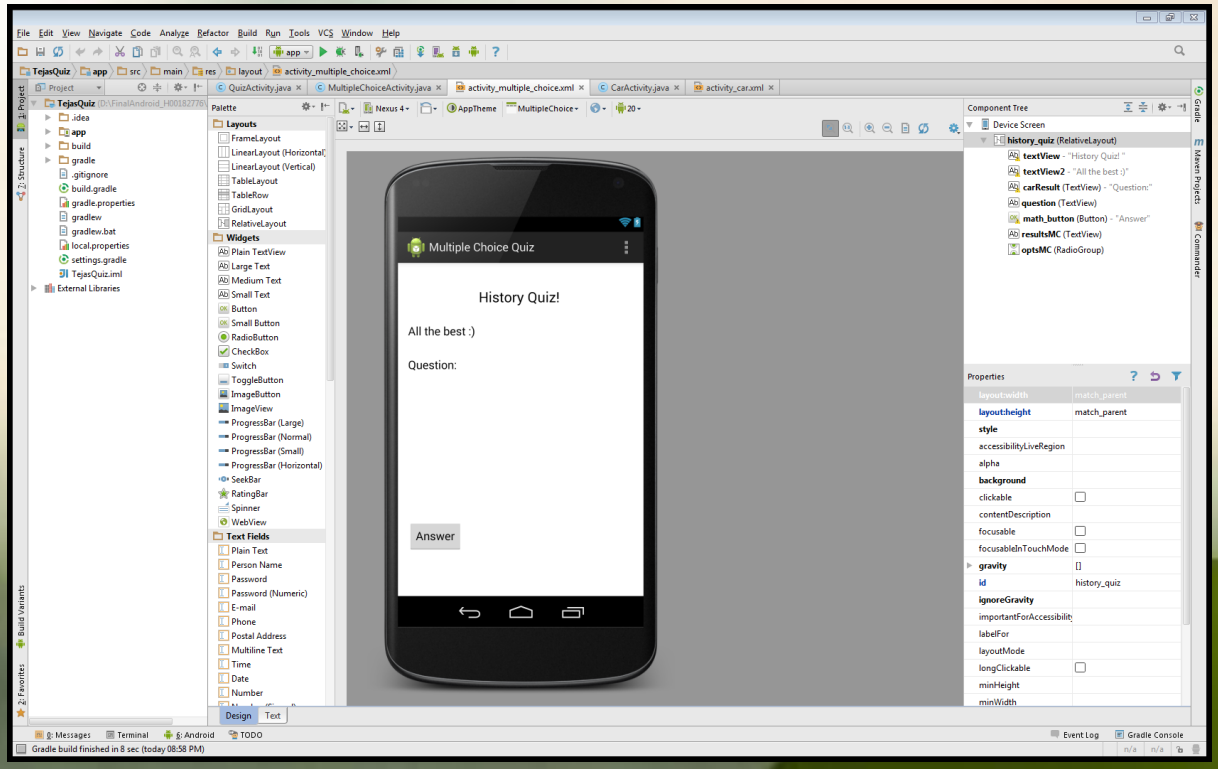
Use Case Diagram



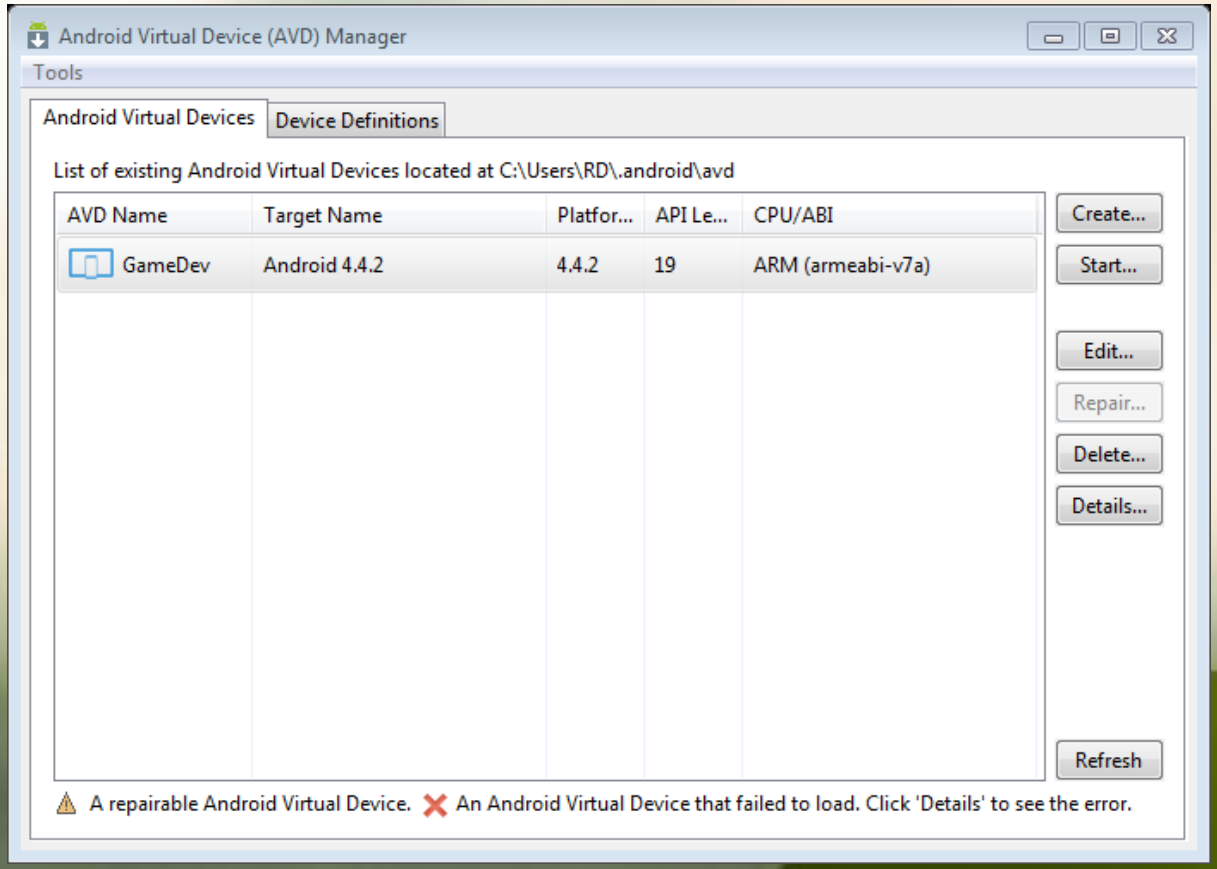
GUI Screenshots



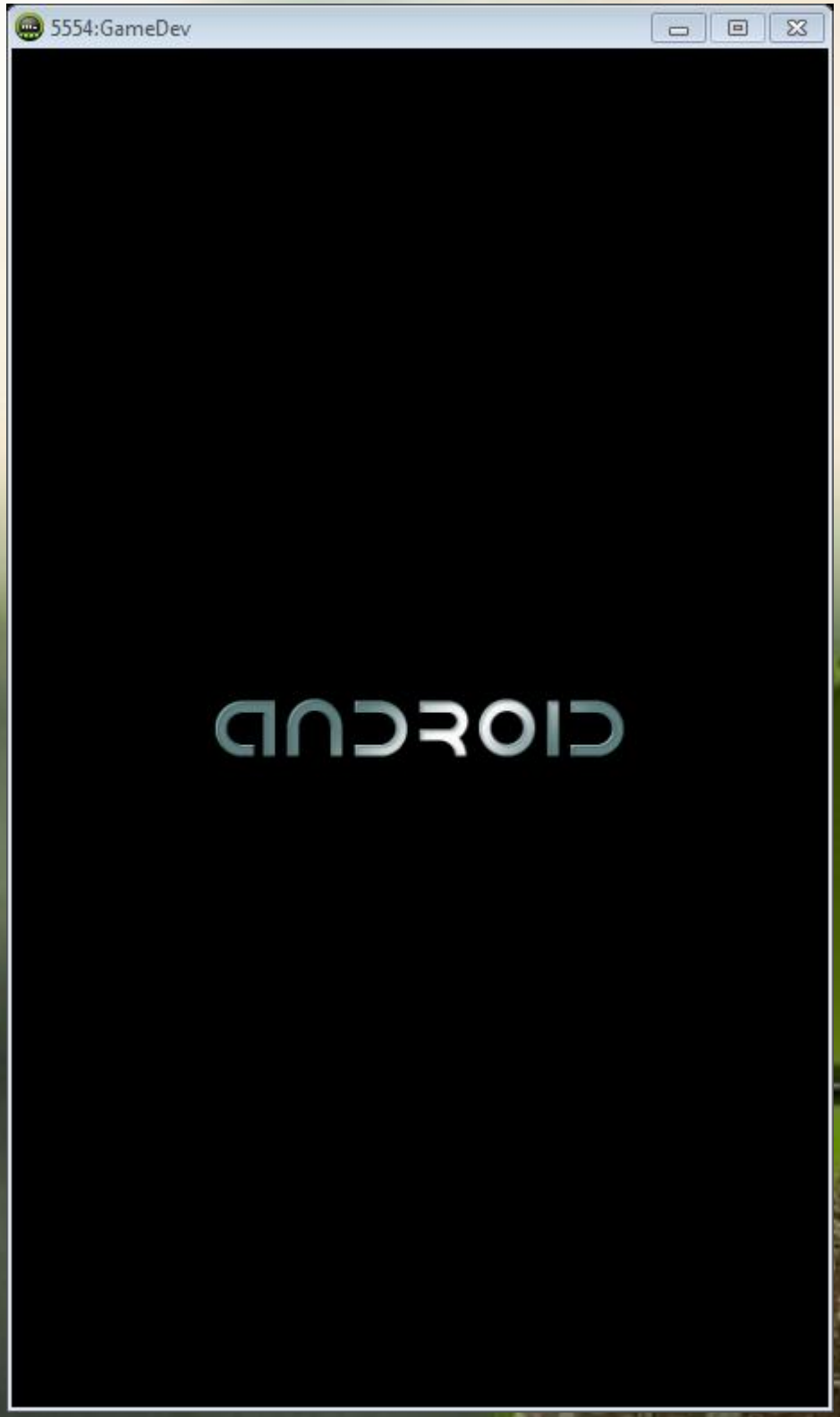
This is the view of the IDE as the program was coded. Represented above is the QuizActivity.java file.



This is the xml design view that comes with the Android Studio. In this view, one is able to structure the components of the application effectively.

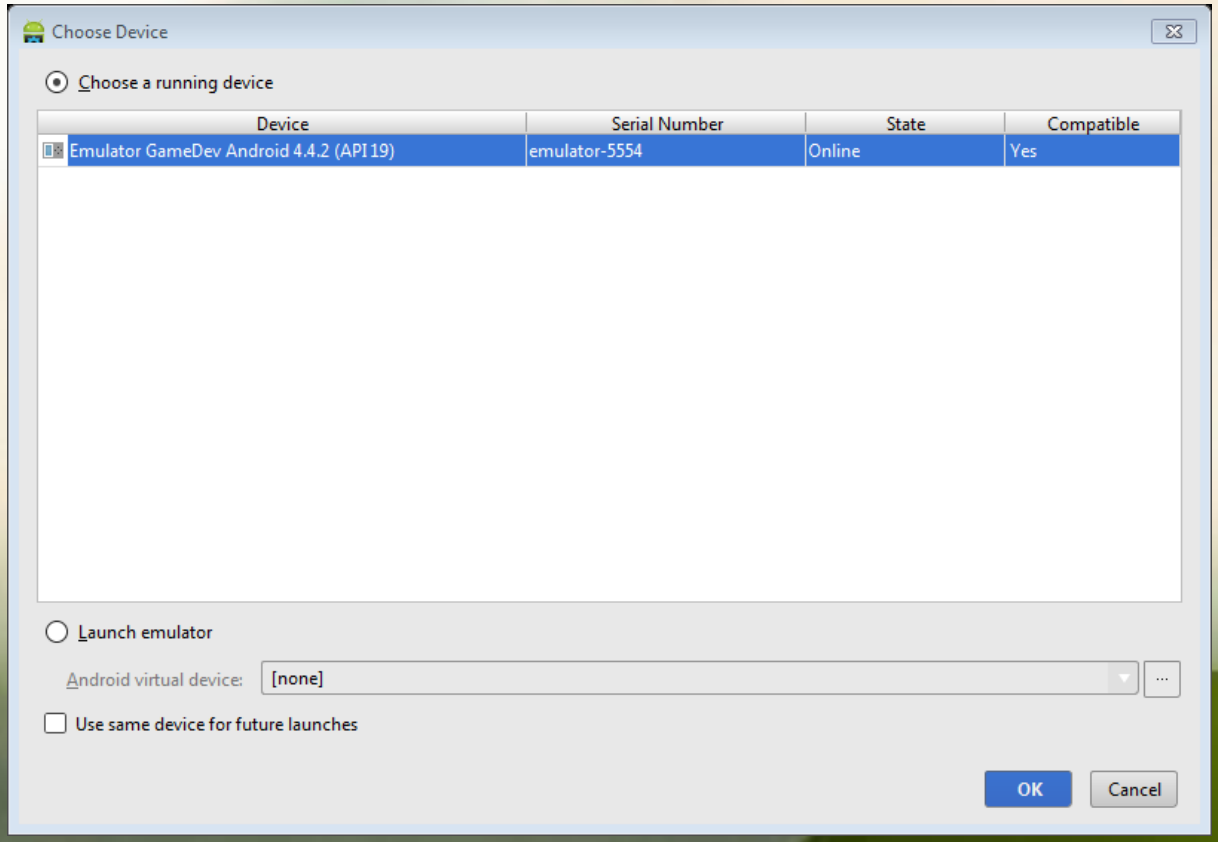


Above is an image of the Android Virtual Device Manager. Here we are able to create a number of emulator devices to test the applications we make.

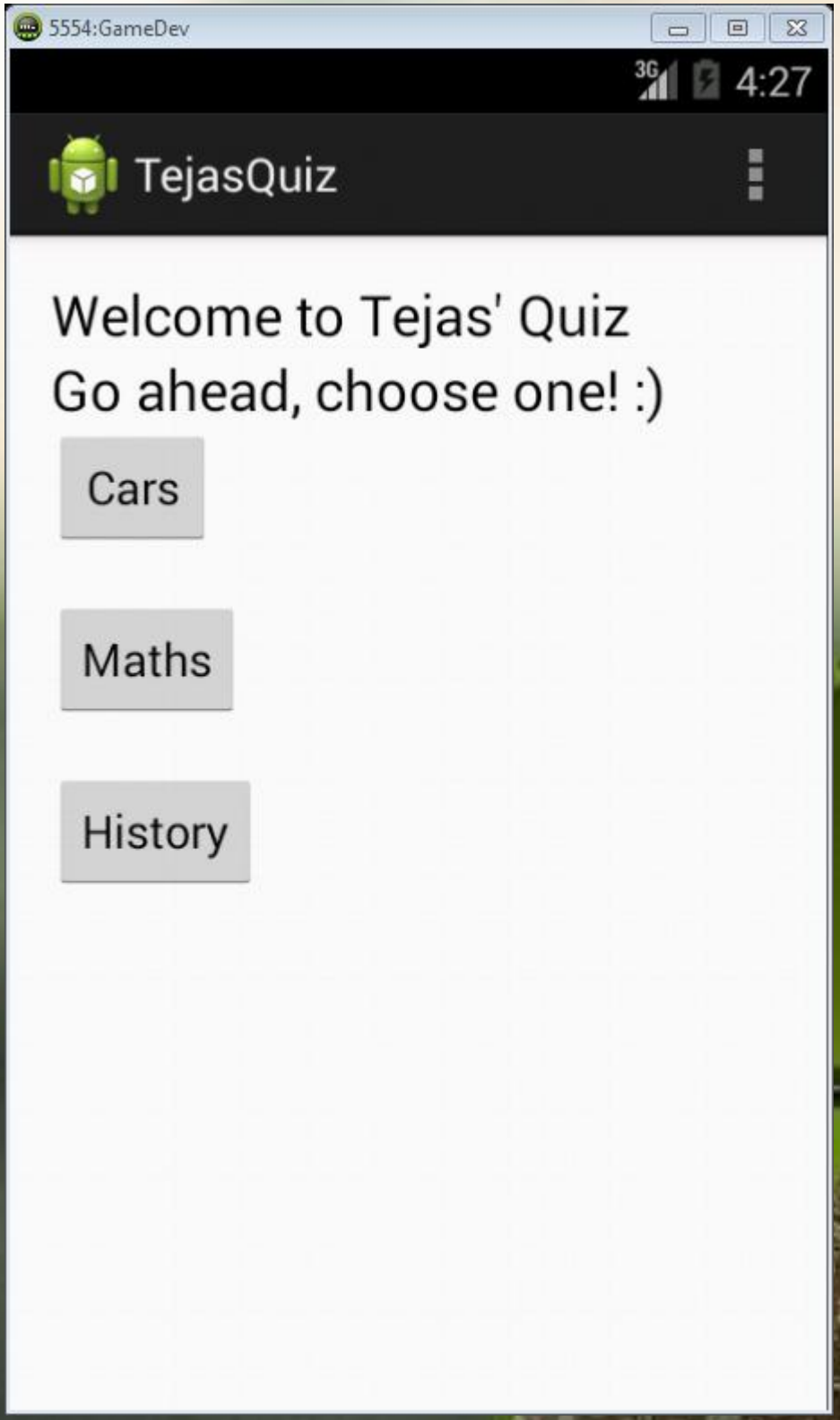


This is what the Android Emulator looks like when it is starting up.

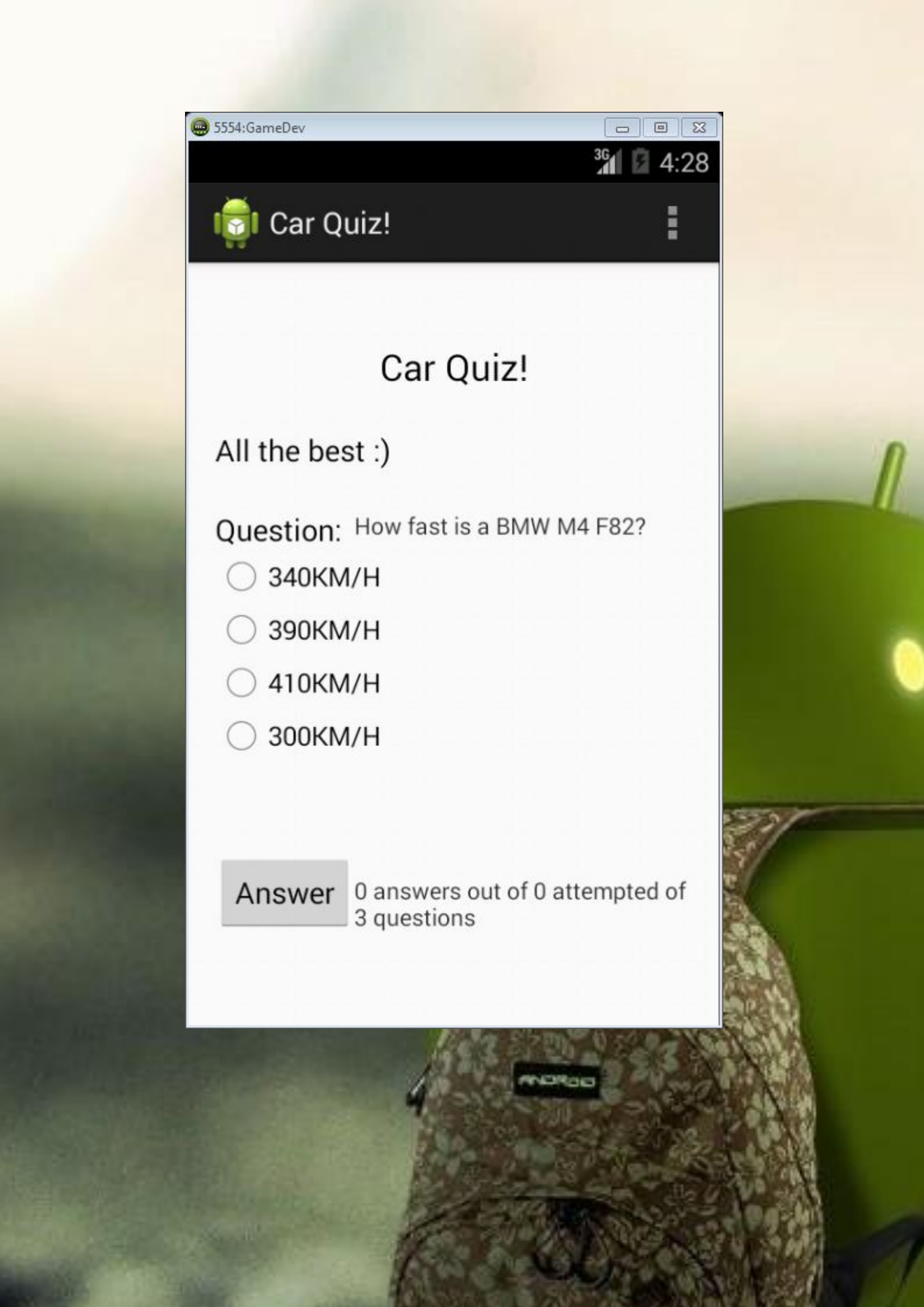
This is the start screen of the Android Emulation Device

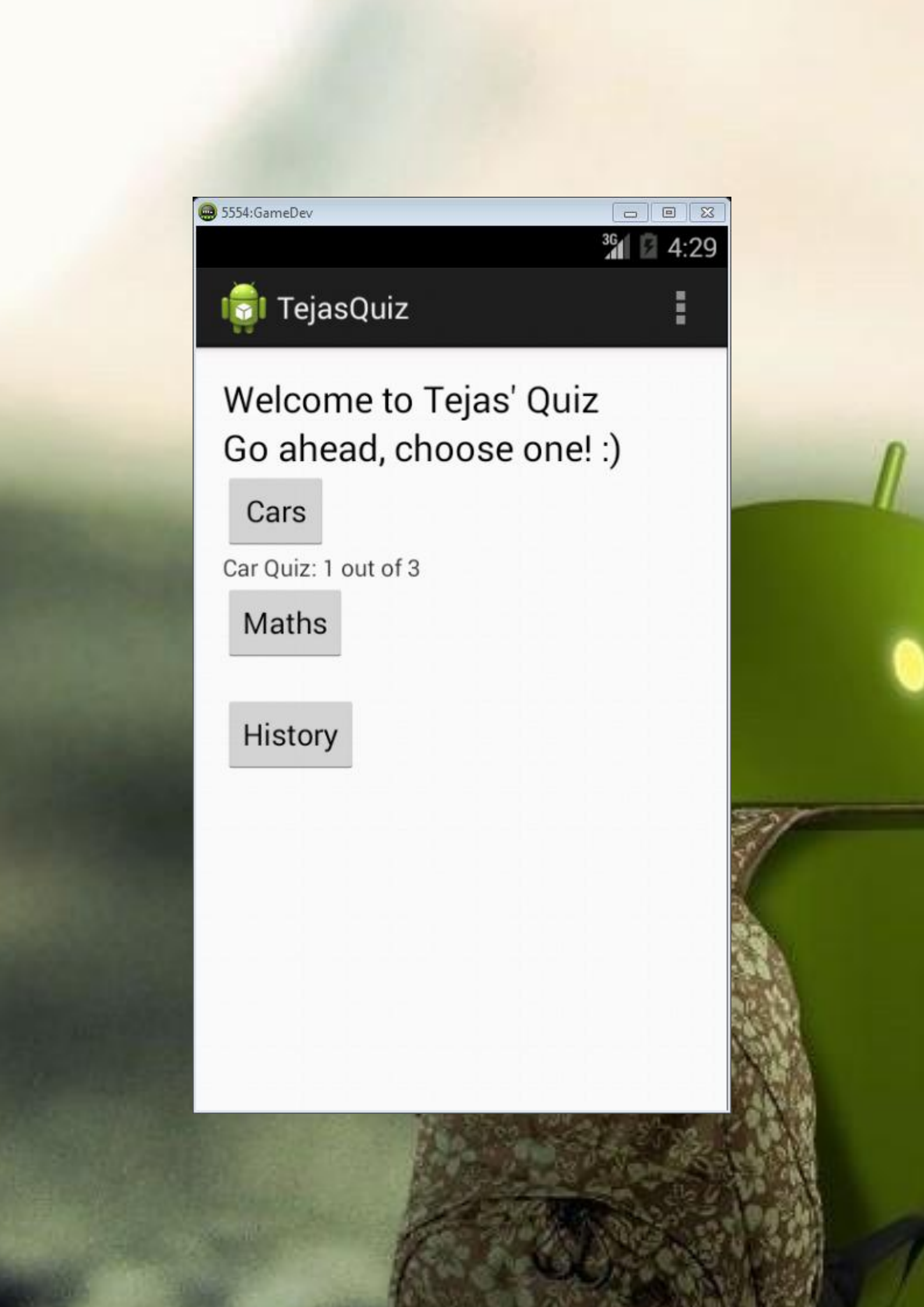


When running the program, we are given the option to choose which device we wish to run the test on. Based on how many emulated devices we have running concurrently.



This is the main screen of the application that was produced for this project


5554:GameDev
4:28
Car Quiz!
Car Quiz!
All the best :)
Question: How fast is a BMW M4 F82?
340KM/H
390KM/H
410KM/H
300KM/H
Answer
0 answers out of 0 attempted of 3 questions


5554:GameDev
3G
4:29
TejasQuiz
Welcome to Tejas' Quiz
Go ahead, choose one! :)
Cars
Car Quiz: 1 out of 3
Maths
History

Bibliography

Steele, J, 2012. The Android Developer's Cookbook. 4th ed. Boston: Addison-Wesley

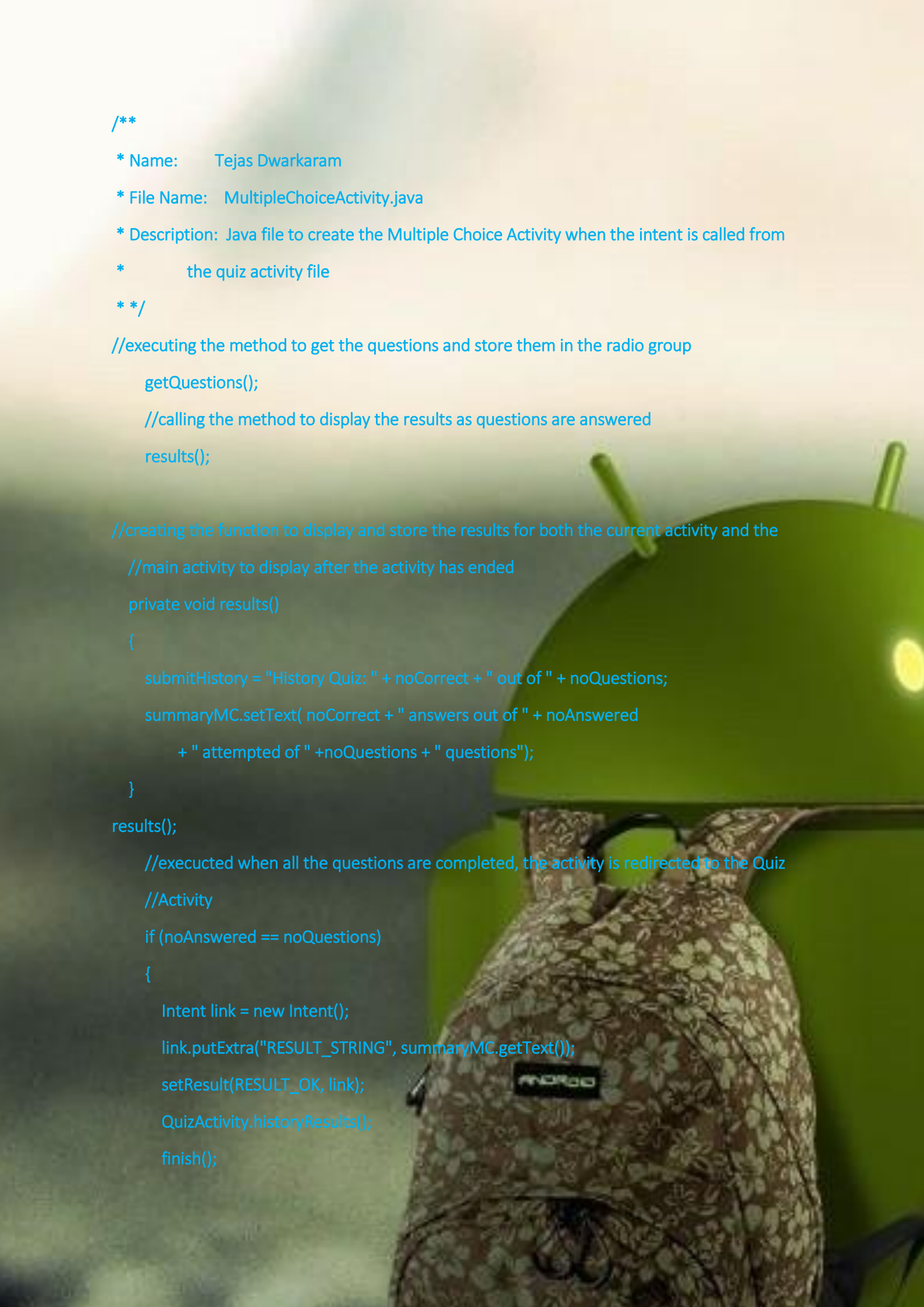
Source Code

The following code segments were created in order to accommodate the accumulation of results on each activity, as well as display it on the main activity page

```
/**
* Name:        Tejas Dwarkaram
* File Name:    QuizActivity.java
* Description:  Java file to create the initial layout for the quiz activity
* */
//creating the individual result variables to store the updated record of each quiz
      historySummary = (TextView) findViewById(R.id.historyResult);
      mathSummary = (TextView) findViewById(R.id.mathResult);
      carSummary = (TextView) findViewById(R.id.carResult);
//creating the method to get the accumulated results from the car activity
   public static void carResults(){
      carSummary.setText(CarActivity.submitCar);
   }

   //creating the method to get the accumulated results from the math activity
   public static void mathResults(){
      mathSummary.setText(MathActivity.submitMaths);
   }

   //creating the method to get the accumulated results from the history activity
   public static void historyResults(){
      historySummary.setText(MultipleChoiceActivity.submitHistory);
   }
```



```
/**
 * Name:        Tejas Dwarkaram
 * File Name:    MultipleChoiceActivity.java
 * Description:  Java file to create the Multiple Choice Activity when the intent is called from
 *             the quiz activity file
 * */
//executing the method to get the questions and store them in the radio group
      getQuestions();
      //calling the method to display the results as questions are answered
      results();

//creating the function to display and store the results for both the current activity and the
   //main activity to display after the activity has ended
   private void results()
   {
      submitHistory = "History Quiz: " + noCorrect + " out of " + noQuestions;
      summaryMC.setText( noCorrect + " answers out of " + noAnswered
            + " attempted of " +noQuestions + " questions");
   }
results();
      //executed when all the questions are completed, the activity is redirected to the Quiz
      //Activity
      if (noAnswered == noQuestions)
      {
         Intent link = new Intent();
         link.putExtra("RESULT_STRING", summaryMC.getText());
         setResult(RESULT_OK, link);
         QuizActivity.historyResults();
         finish();
```

```
    }

/**
 * Name:        Tejas Dwarkaram
 * File Name:    CarActivity.java
 * Description:  Java file to create the Multiple Choice Activity when the intent is called from
 *             the quiz activity file
 * */

//executing the method to get the questions and store them in the radio group
      getQuestions();
      //calling the method to display the results as questions are answered
      results();
//creating the function to display and store the results for both the current activity and the
   //main activity to display after the activity has ended
   private void results()
   {
      submitCar = "Car Quiz: " + noCorrect + " out of " + noQuestions;
      summaryCar.setText( noCorrect + " answers out of " + noAnswered
            + " attempted of " +noQuestions + " questions");
   }

results();
      //executed when all the questions are completed, the activity is redirected to the Quiz
      //Activity
      if (noAnswered == noQuestions)
      {
         Intent link = new Intent();
         link.putExtra("RESULT_STRING", summaryCar.getText());
```

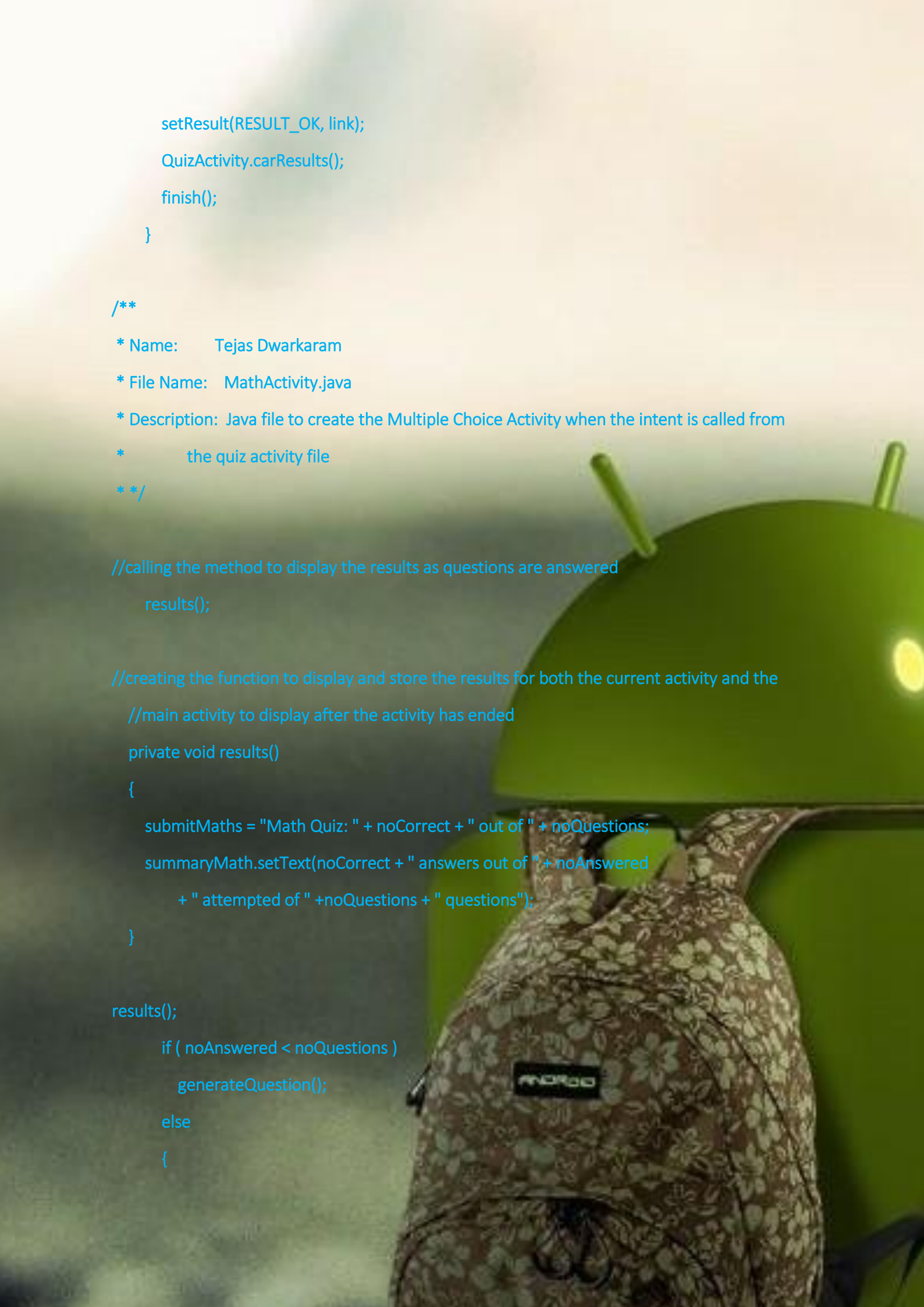
```
            setResult(RESULT_OK, link);
            QuizActivity.carResults();
            finish();
        }

/**
 * Name:        Tejas Dwarkaram
 * File Name:    MathActivity.java
 * Description:  Java file to create the Multiple Choice Activity when the intent is called from
 *             the quiz activity file
 * */

//calling the method to display the results as questions are answered
        results();

//creating the function to display and store the results for both the current activity and the
    //main activity to display after the activity has ended
    private void results()
    {
        submitMaths = "Math Quiz: " + noCorrect + " out of " + noQuestions;
        summaryMath.setText(noCorrect + " answers out of " + noAnswered
                + " attempted of " +noQuestions + " questions");
    }

results();
            if ( noAnswered < noQuestions )
                generateQuestion();
            else
            {
```



```
        //executed when all the questions are completed, the activity is redirected to the
Quiz
        //Activity
        Intent link = new Intent();
        link.putExtra("RESULT_STRING", summaryMath.getText());
        setResult(RESULT_OK, link);
        QuizActivity.mathResults();
        finish();
    }
```