**Software Implementation and Testing Document**

**For**

**Group 11**

Version 2.0

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**1.** **Programming Languages**

Extensible Markup Language (XML) will be used to design the User Interface of the application. Java will be used for the functionality of the application. These languages were chosen because Android applications are written in Java.

# **2.** **Platforms, APIs, Databases, and other technologies used**

Wger - Workout Manager: This API will be used as the source for the exercises used to generate workouts. In the API, exercises are organized according to target muscle groups. In the application, Users will choose the muscle groups they want to work out, and then a workout will be generated by choosing random exercises that match the chosen target muscle groups.

Nutritionx: This API gives access to a database of individual food items and their calorie count. This will be used for the “Input Meal” and food suggestion features.

Firebase Realtime Database: This is a cloud-hosted database. It will be used to store personal data such as weight changes, caloric consumption, saved workouts, meals eaten, and time spent working out.

HelloCharts-Android: Third party library used for creating charts and line graphs. It will be used to visualize information like body weight changes and macronutrient breakdowns.

# **3.** **Execution-based Functional Testing**

The “Kitchen” and “Gym” buttons change the page of the application to their respective homepage. On the Gym homepage, the “Create Workout” button changes to the page that allows the User to choose which muscle groups they want to work out. After “Generate Workout” is pressed, it takes the User to the UI that will show the generated workout. When “Start Workout” is pressed, it then goes to the UI with a similar layout of showing the workout, but the button now reads “End Workout”.

NutritionX’s database contains information on all types of food and the nutritional value that comes with them. TheMealDB allows a search for a recipe based upon a main ingredient. The same goes for Wger’s database, which contains the workouts. There was an issue with Wger that it would return user-created workouts, for instance, an API request for a bicep workout could return a German titled workout, even though Wger shows a plethora of workouts on their website. These APIs were tested and verified to return the stated information in JSON format via the web browser.

Google’s Firebase works as intended. When a new sign-up is created it will be added into the DB as a new User, containing a Username, Password, Email, currentWeight, and goalWeight. If the user is already in the system they are allowed to login.

# **4.** **Execution-based Non-Functional Testing**

Viewing other Android apps confirms that it is possible to implement features for people with vision issues. For database implementation, Google’s Firebase will provide the KitchGym with ample amounts of storage and processing to effectively store custom workouts and recipes that each user creates/saves. As for the device the app is on, Android Studio’s emulators confirm the application’s ability to run as long as they are running Android 4.0.3 or higher.

# **5.** **Non-Execution-based Testing**

Android Studio simplifies the process of designing the UI for an application by automatically generating the XML code; With this feature, reviewing the XML code is a simple process of making sure the correct type of components were placed in the correct locations. Peer code reviews were conducted when one member pulled another’s code from the GitHub repository, and everything was made sure to be working. Short walkthroughs through the various pages of the application were conducted, starting from the main home page, to the “doWorkout” activity. Upon doing this inspection, it was clear what aspects were missing and need to be developed in the next iteration.

The exercises available in the Wger API are available online. This database was checked to ensure that each exercise included the attributes needed to identify the correct one for the workout generation in the application, such as the exercise name and target muscle group.

Much of the design of the app is subjective and cannot be measured in clear terms; rather, when one member makes changes to the design, layout, or aesthetic choices within the app, the effect is tested by the rest of the group by their interaction with the app.

The login information is stored here: <https://console.firebase.google.com/u/0/project/thekitchgym/database/thekitchgym/data>, where we can view the name, email, password, weight, and goal weight of our users and verify that the application is successfully storing the information.