CROWDSOURCING DIABETES APPLICATION

ABSTRACT

Many people have been and still are suffering from diabetes. Even though they have diabetes, they still have a craving for various sweets and insist on eating more. Therefore, an Android application has been developed to help patients manage their diet. This application has been targeted towards children to prevent any further complications later in their life. This program was implemented in MIT's AppInventor 2. The application was developed for the child to enter their food intake. Crowdsourcing was used as part of this application in order to create a community for diabetes patients. In order to implement the crowdsourcing, Google Forms were used as part of the application. To create the application, first the main screen was created which has buttons leading to the other screens. Next the basic information screen, weight tracker, and blood pressure tracker were created using the Tiny WebDB. This database is used to store information directly into the phone. Then the daily food intake, and restaurants screens were created using the Google Forms. When users enter their information into the Google Form, it goes into a shared spreadsheet, they so other users of the application can go and see if the food are eating is good for them or not. The spreadsheet also allows for graphs to be created if seeing a trend that way is a lot easier. Overall, the application is created to help diabetes patients as much as possible.

BACKGROUND RESEARCH

Diabetes is when the body does not properly use or store the glucose (Mayoclinic). There are two types of diabetes that a person can have. Type I diabetes is when the patient has a complete lack of glucose in their blood stream. This type of diabetes is normally seen in children at a very young age. Type II diabetes, on the other hand, is when the patient's body doesn't produce enough glucose (Heartorg). This type of diabetes is mostly shown in adults. The common treatment for this disease is to have a consistent diet. Diabetes not only affects the glucose levels, but when one has diabetes it affects other parts of the body as well. It leads to many other body problem, such as heart attacks or extreme liver cancer in the patient's body. Since diabetes causes problems with other bodily functions, it is important to reduce the diabetes as much as possible, especially in its early stages to prevent any future problems(Li). The reason for putting this in an application is that technology is growing rapidly and is becoming a part of everyday life (Tnark). Statistics show that more people are using technology daily, therefore in order for diabetes patients to track their daily food, it would be best to do it using an application (Intersperience).

INTRODUCTION

Diabetes has been a major problem, and continues to be a problem in the world. Diabetes is when a person does not have the insulin in their body to control their glucose levels in their blood. Either they don't have insulin or they have a lack of insulin. In order to reduce any further complications, diabetes patients must control their diet and manage their exercise.. In order to help their diet and exercise, an Android application is created to help track their diet . In order to have a "community" type feel between all diabetes patients, the app uses crowdsourcing, so that patients can help each other with what food they can eat and asp not eat.

PURPOSE

The purpose of this study is to create an effective application for diabetes patients, and to help them track their diet in a modern and efficient way.

MATERIALS

- Windows 8 HP Pavilion Laptop
- MIT App Inventor 2 Software
- Google Nexus 2 Tablets
- Samsung Galaxy S4 cell phone

SAMPLE CODE

Figure 1: Google Form linked to application using WebViewer
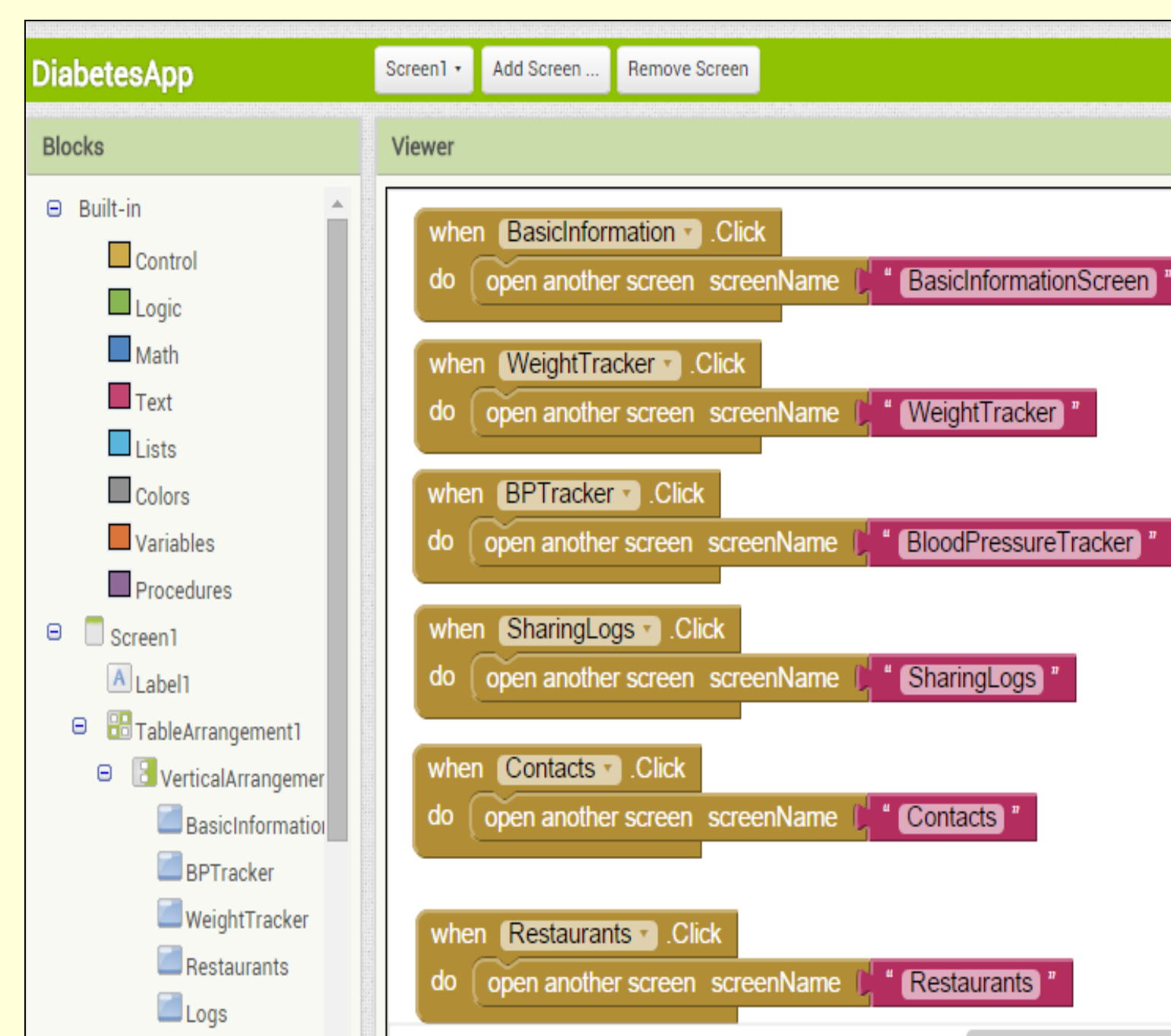
Figure 2: Main screen linking to other buttons in the application
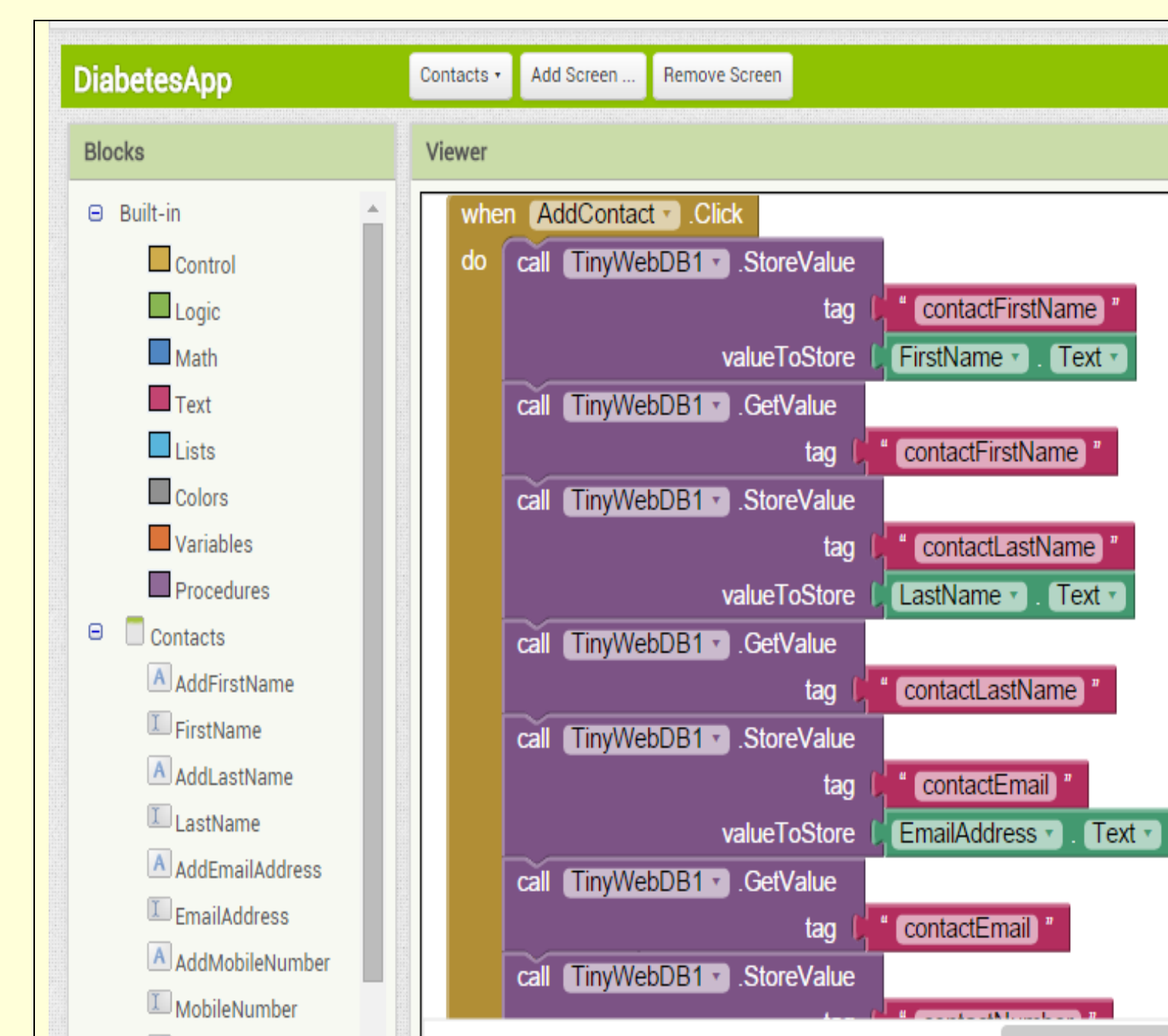
Figure 3: Information stored in Tiny WebDB

APPLICATION
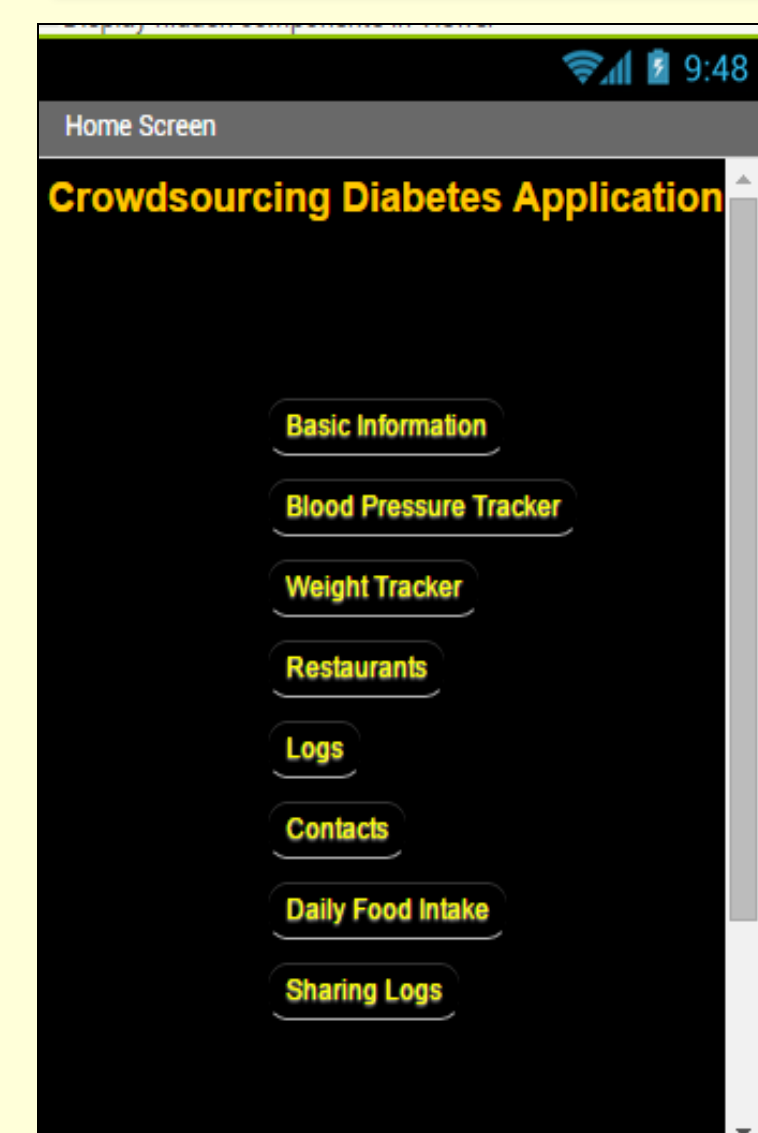
Figure 4: Main screen of application
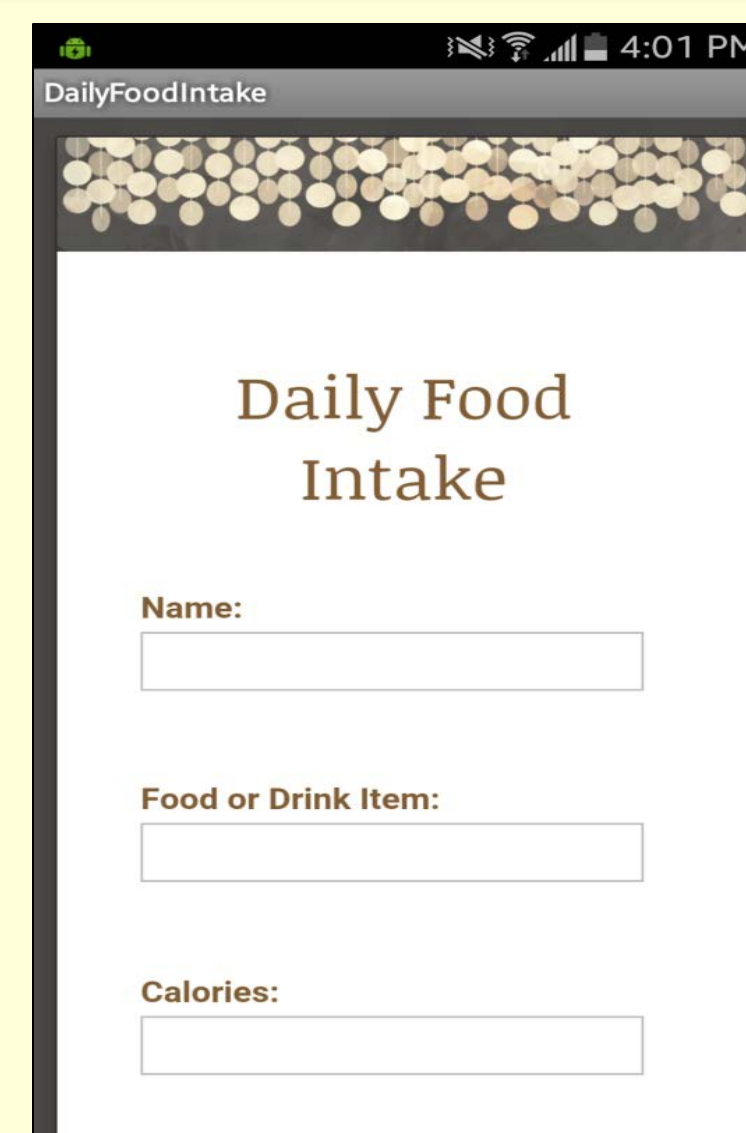
Figure 5: First half of Google Form, asking users questions about daily food intake

Figure 6: Second half of Google Form, asking users about daily food intake

Figure 7: Data received to Google Spreadsheet from the forms in figures 5 and 6.

Figure 8: Basic Information Screen where information is stored in the Tiny WebDB

Figure 9: Second half of basic information screen.

Figure 10: User entering data into the Google Form.

ENGINEERING GOAL

It is possible to create an application for diabetes patients to track their diet and exercise and to have a community of patients.
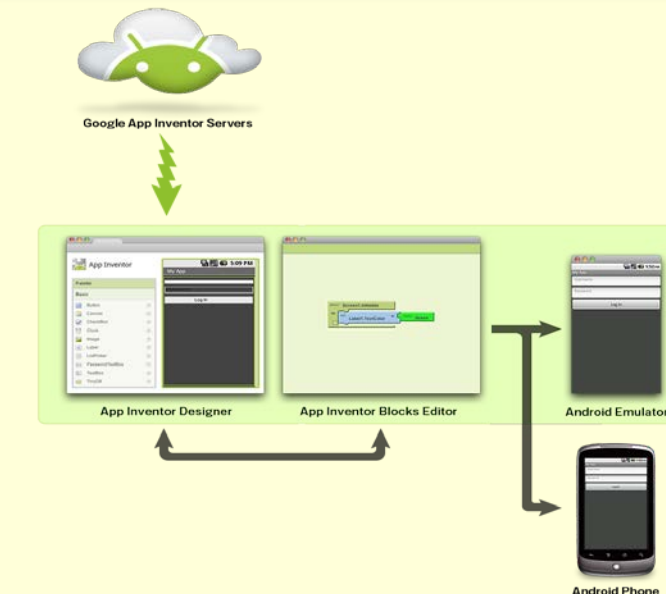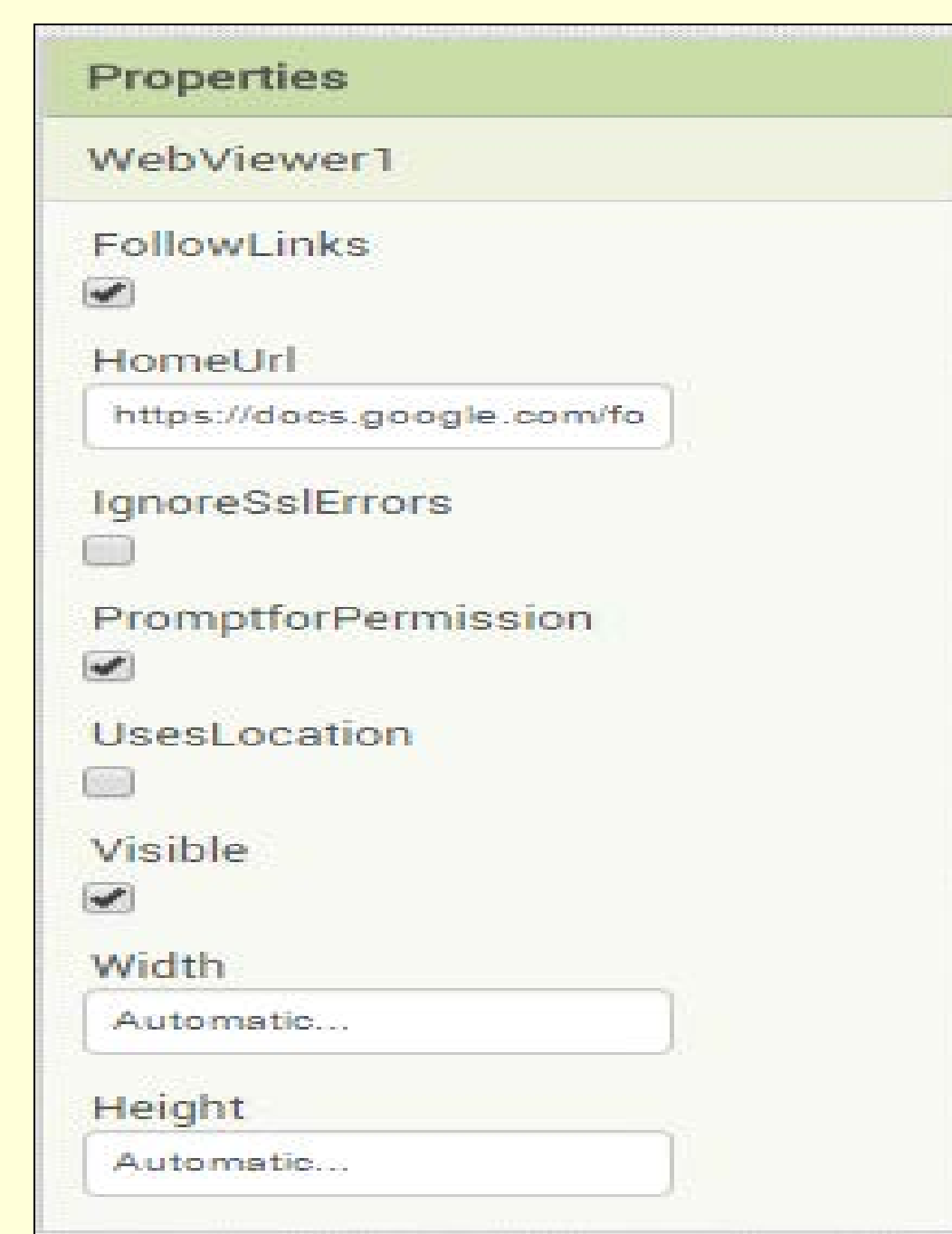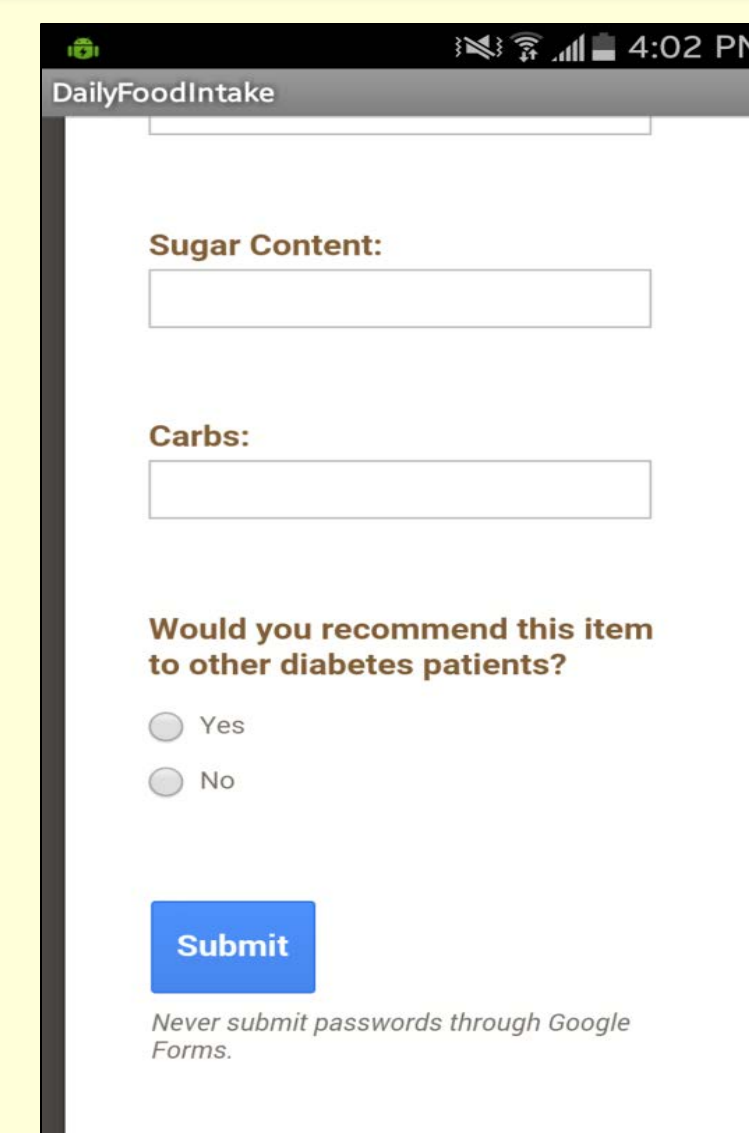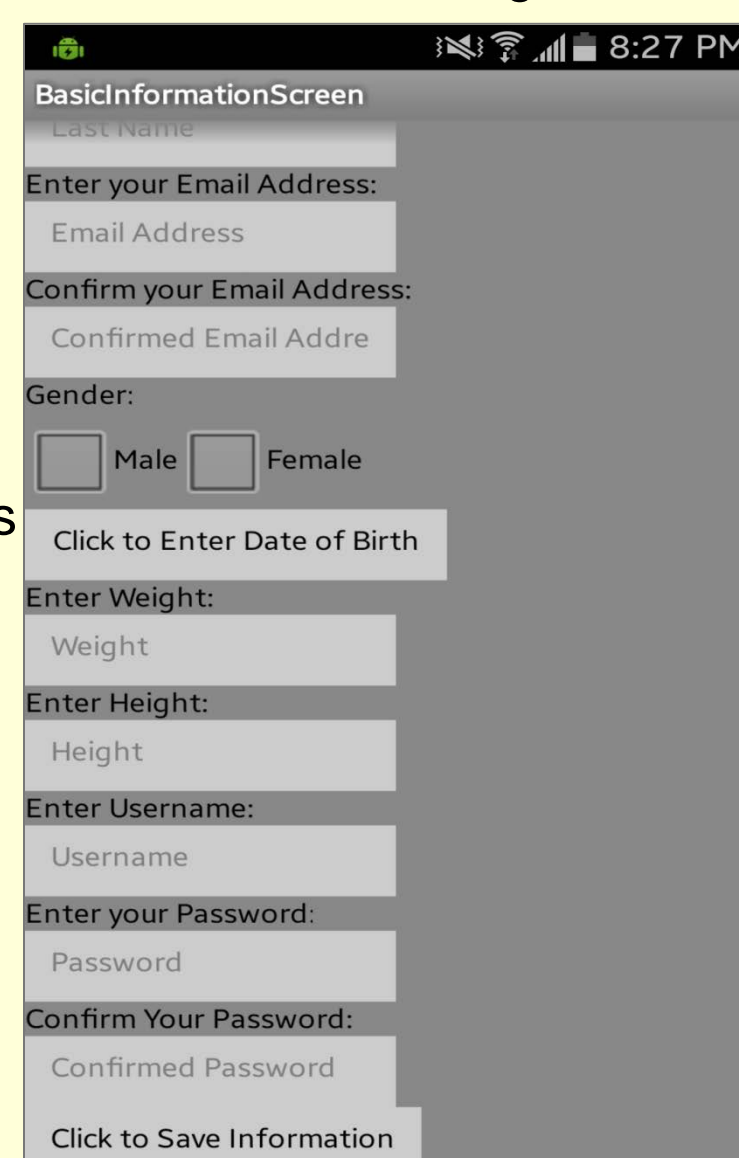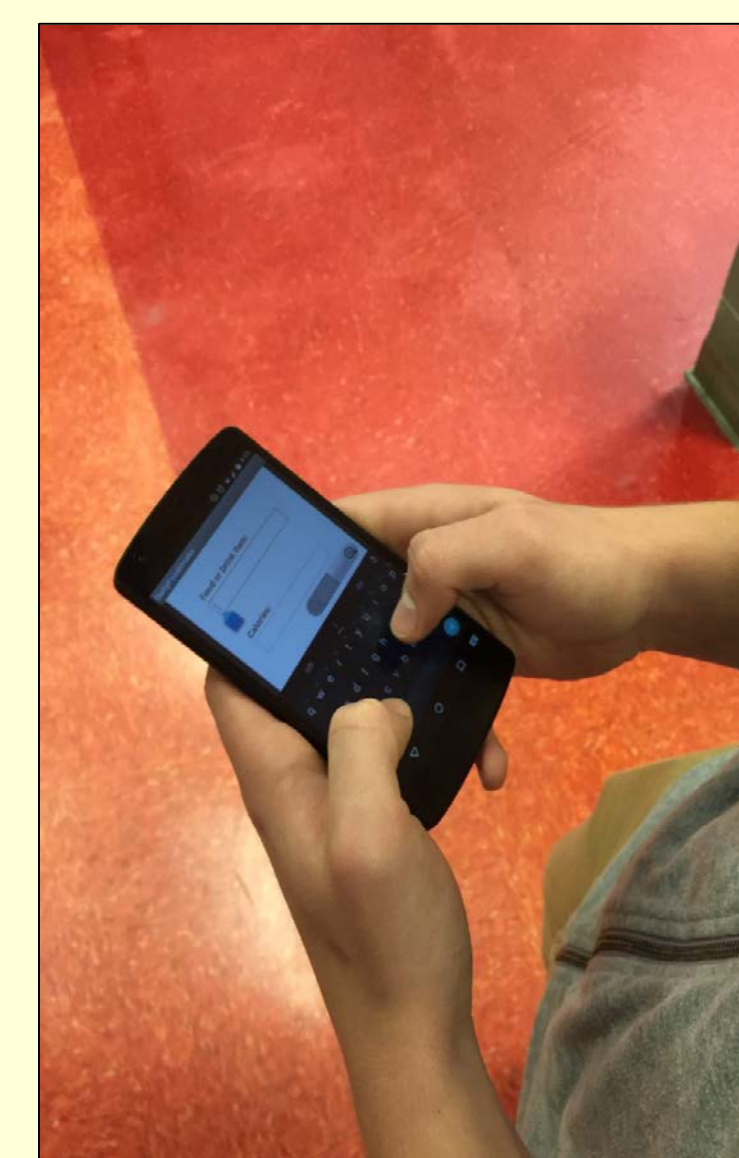
HOW IT WORKS

Diagram shows how App Inventor works. First it comes form the Google cloud, then app inventor designer/blocks editor, and then emulator.

PROCEDURE

To create the application, MIT App Inventor 2 was used on the Windows 8 HP Pavilion Laptop.
- The main screen was created, containing buttons that lead to the other screen.
- The respective screens for each button was created (Basic Information, Blood Pressure Tracker, Weight Tracker, Restaurants, Logs, Contacts, Daily Food Intake, and Sharing Logs)
- Google Forms were used for Restaurants and Daily Food Intake, and responses go to a Google Spreadsheet.
- The remaining screens were stored in a Tiny Web DB which was linked to a server so that more information could be stored.
- The app was given to a user to test, to make sure that all the features were working properly.
- When features did not work properly, the bugs were fixed.
- The application was tested on various Android devices such as the Samsung Galaxy S4 and the Google Nexus tablet.

RESULTS

Based on the data table presented in Figure 7, it is proven that the application successfully stores data in a data table that can potentially be accessed by other people. This data could be used to produce graphs that shows how much the user is eating in comparison to the other days.

CONCLUSION

The application was created successfully including the crowdsourcing of the application, making a community for diabetes patients. Since the application has been successfully created patients can use it to track their diet. In addition, they are able to communicate with the other patients in some way to help them control their diet and in turn control their diabetes.

FUTURE RESEARCH

- Displaying the spreadsheet on the application
- Sending automatic text messages to doctors.
- Allowing multiple users to have access to the spreadsheet
- Enhancing the application to take information for different diseases

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