Julie Huang

Assignment 2 - OSS Individual Project Proposal and Specifications

2/23/18

Name of repository: Glucosio/glucosio-android

Link: https://github.com/huangj11/glucosio-android

Project title: Glucosio: Workout Mode

Social justice issue:

It can be difficult for people diagnosed with diabetes to regulate their blood sugar. For diabetics with an active lifestyle, this is an even greater challenge due to the large impact physical activity has on glucose levels. Diabetic athletes must strictly regulate their blood sugar and understand what their blood sugar should be ahead of time to safely participate in physical activity. Failure to do so can lead to disastrous consequences to one's health. Diabetes should not prevent someone from living a healthy, active life, especially since exercise has been shown to have beneficial effects for those with diabetes.

Project idea:

The proposed solution to the issue falls in the category of Option 2.

The project idea to take the FOSS Glucosio and alter it to include a "workout mode" feature to monitor blood sugar for physical activities.

Languages and platform:

The app is a mobile app that will be developed using Java in Android Studio.

Innovation:

Glucosio allows users to enter their blood glucose level, body weight, HbA1c reading, blood pressure, ketones, and cholesterol level into the app. The app then plots the data into a chart, which the users can access. Users can personalize and manage the information based on their own body.

Although there are a number of apps with similar functions for tracking blood sugar for diabetics in their everyday life, there don't seem to be apps specifically for diabetic athletes. The new feature will be geared toward diabetics with an active lifestyle and seeks to help maintain the added precaution athletic diabetics have to deal with. It will allow users to input their current blood glucose level before exercising, and suggests either taking more carbs to raise their blood sugar, or waiting or taking insulin to lower their blood sugar. If the user is a type 1 diabetic, it will also prompt the user to check their ketones level before exercising, and warn against exercising if there are ketones present. It will also prompt the user to check their blood sugar after exercising.

Addressing the social justice issue:

By making suggestions based on blood glucose levels, the feature provides useful guidelines for the user and allows them to enjoy the active lifestyle they choose to have.

Algorithms:

The algorithm to be used will take the user's current blood sugar level, and compare it to the ranges of "Lower than 100 mg/dL" (too low, eat carbs), "100 – 150 mg/dL" (fairly safe, but should eat a snack), "150 – 200 mg/dL" (safe, may need a snack if lengthier exercise), "250 – 300 mg/dL" (fairly safe, proceed with caution), and "300 mg/dL or higher" (too high, should wait or take insulin). These rates are general guidelines for now.

Data structures:

The blood sugar and ketone data will be stored in the data structures already established by the open source software. The ranges of pre-exercise blood sugar may be stored in a hash table, or remain simply as variables.

New software engineering concepts:

- Incremental development model
- Understand use case diagrams and how to adhere to them while developing
- Apply quality assurance and testing during development

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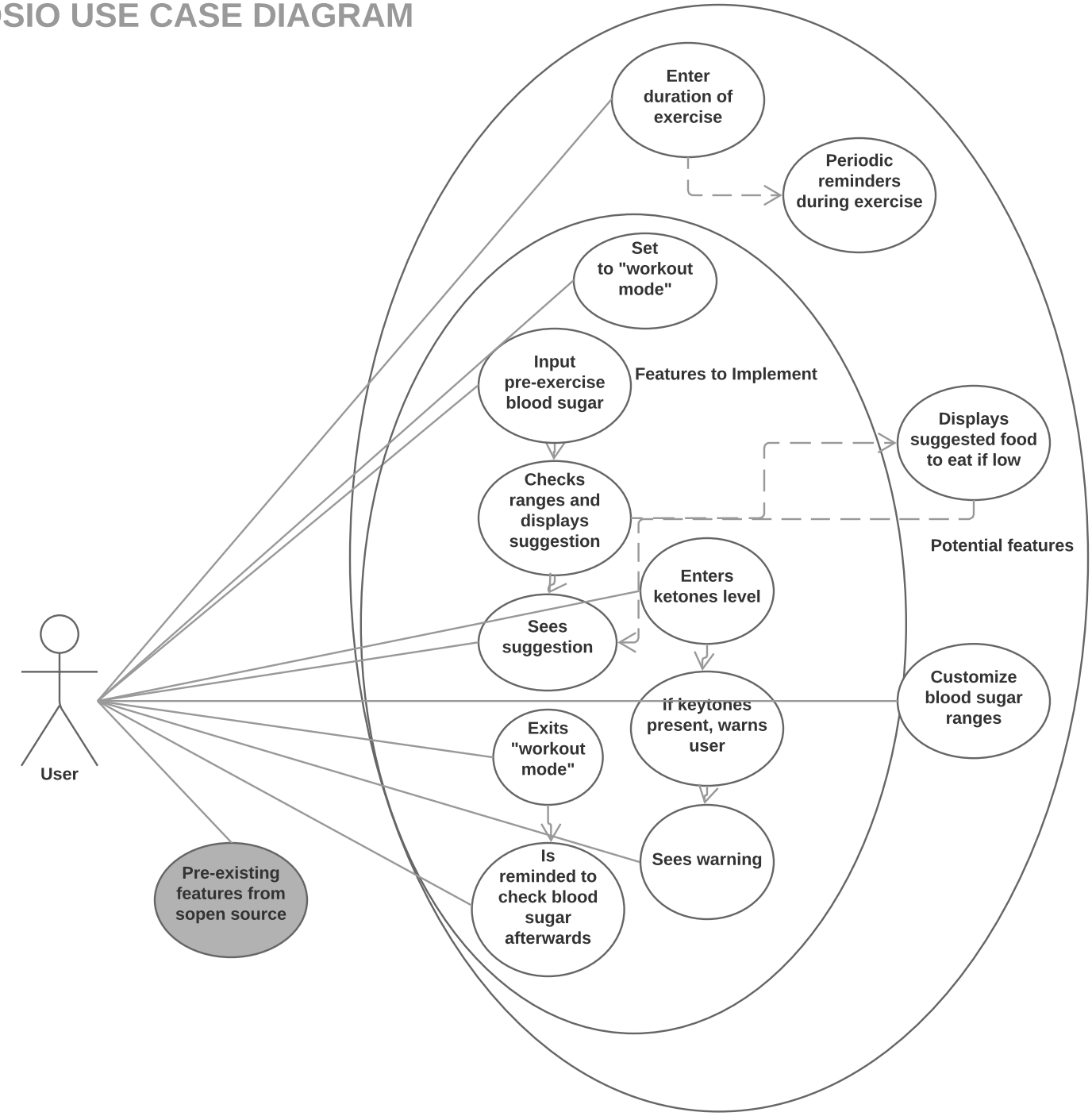
GLUCOSIO USE CASE DIAGRAM



Gantt Chart

PROJECT TITLE

3/12/18

TASK NUMBER	TASK TITLE	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE	PHASE ONE										PHASE TWO										PHASE THREE									
						Week of 2/25-3/3					Week of 3/4-3/10					Week of 3/11-3/17					WEEK of 3/18-3/24					Week of 3/25- 3/31					week of 4/1-4/7					Week 4/8-4/14					Week of 4/15-4/21				
						M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F
1	Research Topic to Solidify Algorithm	2/24/18	3/10/18	14	0%																																						
2	Understand Source Code	2/24/18	3/16/18	20	0%																																						
3	Assignment 4a-OSS Individual Project Analysis and Design	3/10/18	3/20/18	10	0%																																						
4	Assignment 4b-OSS UI Design and Prototype	3/20/18	4/6/18	17	0%																																						
5	Assignment 6-OSS Individual Project Implementation	3/30/18	4/17/18	18	0%																																						