Software Requirements Specification
For
Powerlifting Toolkit

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COMP 442 - Section 001

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Version History

Version	Date	Name	Description
1	11/10/19	Daniel Kotlinski	Initial Document
2	12/02/19	Daniel Kotlinski	Updated with new class diagram
3	12/15/19	Daniel Kotlinski	Updated with new Use Case Diagram

1   Introduction

1.1 Overview
This document provides the software requirements specification for the Powerlifting Toolkit application. This application is intended for powerlifters or any other person who finds its features useful.

The Powerlifting Toolkit allows for the user to convert between pounds and kilograms, visualize which colored plates they need in order to reach a given weight in kilograms, calculate wilks score, as well as calculating the lifters one repetition maximum. Its design allows for it to be a useful tool, imposing minimal work done for users.

It is important to understand that the Weight Visualizer displays what one side of the bar will look like and not what both will look like. This is because the other side would be mirrored, seeing as how both sides must have the same arrangement of plates or else the bar would be uneven.

This document does not address the specific test cases for the application. Test cases are documented on their own, separate file.

1.2 Goals and Objectives
The powerlifting toolkit goals are as follows:
1. Provide a clear and easy to use GUI for the user
2. Effective and precise calculations given proper user input
3. Feature most necessary sub-applications that a lifter could need

1.3 Scope
The Powerlifting Toolkit will take user input to perform a number of selected calculations. It will not store data in a cache or history anywhere. The application should be used as a calculator.

1.4 Definitions
Wilks - A score given to a lifter based off of weight lifted, bodyweight, and gender. Allows for lifters to compare strength given different weight lifted, bodyweight, and gender.

One Rep Max (ORM) - Maximum weight that a lifter can complete for one repetition.

Plates - The weights added to the bar are referenced to as plates (since they are plate like). They come in colors such as red, blue, yellow, green, white, black and silver. They are ranked from heaviest to lightest in that given order.

1.5 Document Conventions

In the weight visualizer, plate colors have the following weight:

Red: 25KG

Blue: 20KG

Yellow: 15KG

Green: 10KG

White: 5KG

Black: 2.5KG

Silver: 1.25KG

2 Nonfunctional Requirements

The nonfunctional requirements for the Powerlifting Toolkit are as follows:

Results of any input is own shown after user clicks corresponding button
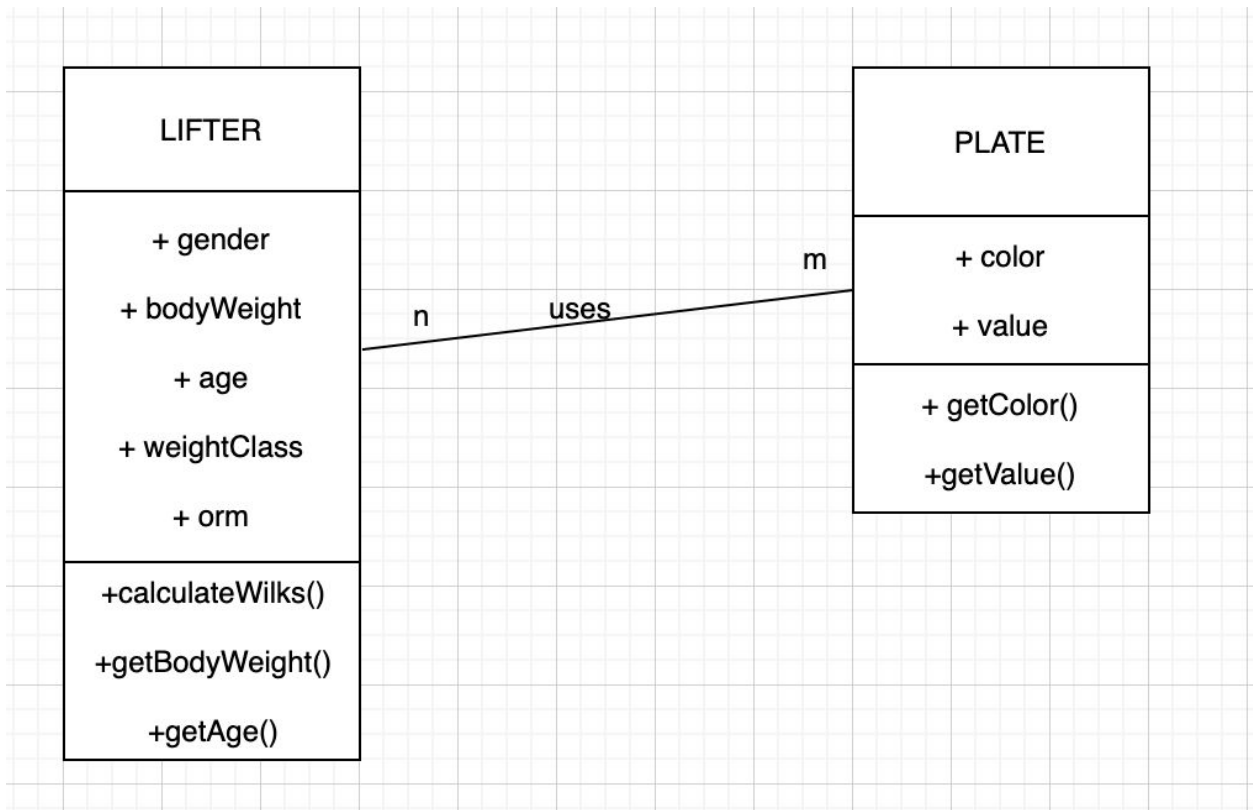
Bodyweight entered should be in pounds (for calculation purposes)

Can only be run on devices supporting Python

All available tools should use industry accepted calculations

Must support numeric values as input

3 Class Diagram

```
┌─────────────────────────┐                              ┌─────────────────────────┐
│         LIFTER          │                              │         PLATE           │
├─────────────────────────┤                              ├─────────────────────────┤
│       + gender          │      m                       │       + color           │
│                         │                              │                         │
│      + bodyWeight       │  n      uses                 │       + value           │
│                         │                              ├─────────────────────────┤
│        + age            │                              │      + getColor()       │
│                         │                              │                         │
│     + weightClass       │                              │      +getValue()        │
│                         │                              └─────────────────────────┘
│        + orm            │
├─────────────────────────┤
│    +calculateWilks()    │
│                         │
│    +getBodyWeight()     │
│                         │
│       +getAge()         │
└─────────────────────────┘
```

4 System Requirements

System requirements include the applications main functions, converting pounds to kilograms (and reverse), weight visualizer, wilks calculator, and the one rep max calculator.

4.1 Use Case: Pounds to Kilograms, Kilograms to Pounds

Allows for user to input a weight in pounds, press calculate button, and have that weight be converted into kilograms,

4.2 Use Case: Weight Visualizer

Allows for user to input a weight in kilograms, pressing the button, and have the weights needed displayed on the screen. It only displays what the plates would be on one side of the bar, since the other side is mirrored, or else the bar would be of uneven weight.

4.3 Use Case: Wilks Calculator

Allows for user to input weight lifted (in kilograms), gender, and body weight, effectively calculating wilks score. Wilks score is the score a lifter is granted based off of weight lifted, gender, and bodyweight, allowing them to compare their score to other lifters of different weight.

4.4 Use Case: One Rep Max (ORM) Calculator

Allows for user to input weight lifted and repetitions completed. Pressing calculate button starts the calculation, and displays an accurate one repetition max based on given input. (For example, you want to know how much you can bench but you only know you can bench 135 for 10 reps, this calculator will estimate how much you bench based on that given information),

4.5 Use Case Diagram