

VIP/Senior Project Final Presentation Summer 2020

ComboCounter

Team Member(s): Calvin Mark, Daniel Mato

Product Owner(s): Michael Bucar

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Introduction

With the rise of “smart” workout technology, no current option exists for those who desire an impacted, high energy, cardio-based workout similar to what one would find in a training gym/fight club. ComboCounter is designed to be a workout application which is connected to a “smart” punching bag. This bag will be able to track data metrics such as force and combo effectiveness. The goal of ComboCounter is to connect socially with others while achieving real goals and improving stamina, strength and form!

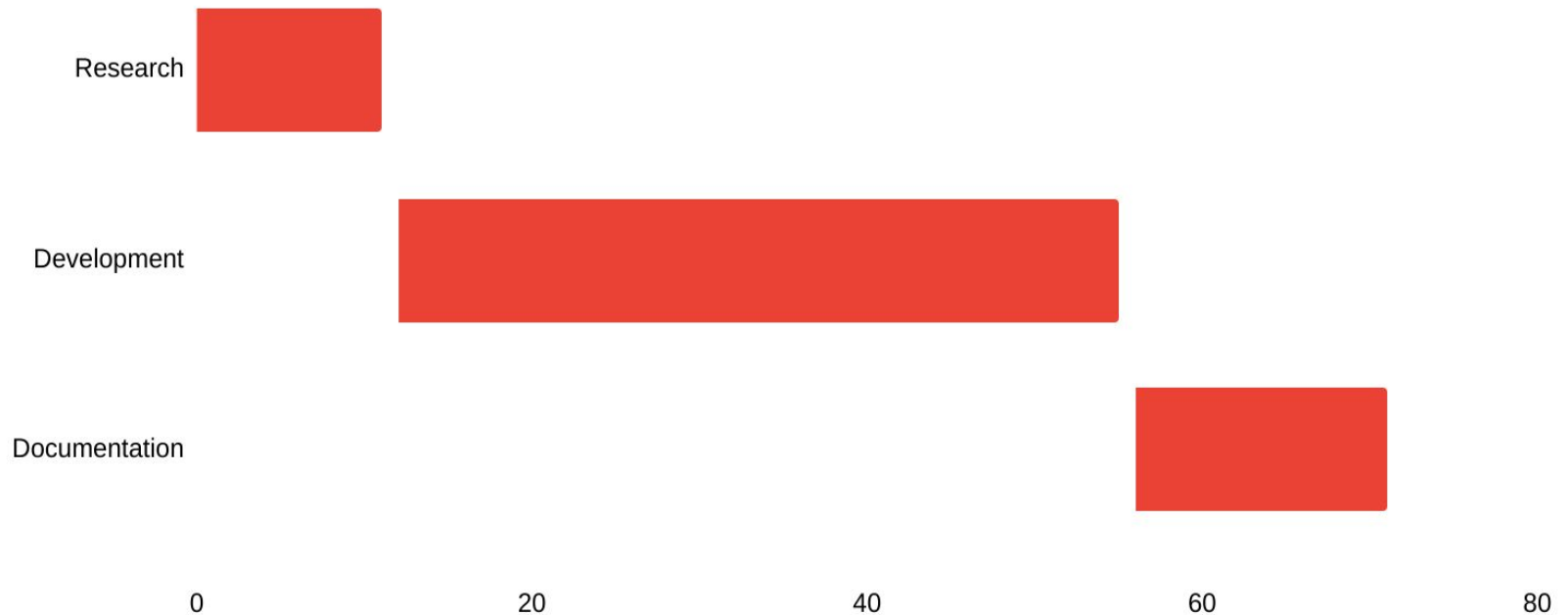
Problem definition

- Whole Project:
 - Currently does not communicate with the sensor
 - Project suffers from a lot of code duplication
 - Database is connected to all features
 - Inconsistent UI elements
 - PO desires visual feedback and a streamlined historic view

- My Part: Daniel Mato
 - Provide an extendable theme system to give the user more control over the application
 - Visual Feedback for User during sessions
 - Make the way the application handles windows more efficient and easier to manage
- My Part: Calvin Mark
 - Provide an extendable theme system to give the user more control over the application
 - Implement features based on user input
 - Ensure UI was consistent

Project Management

Gantt Chart

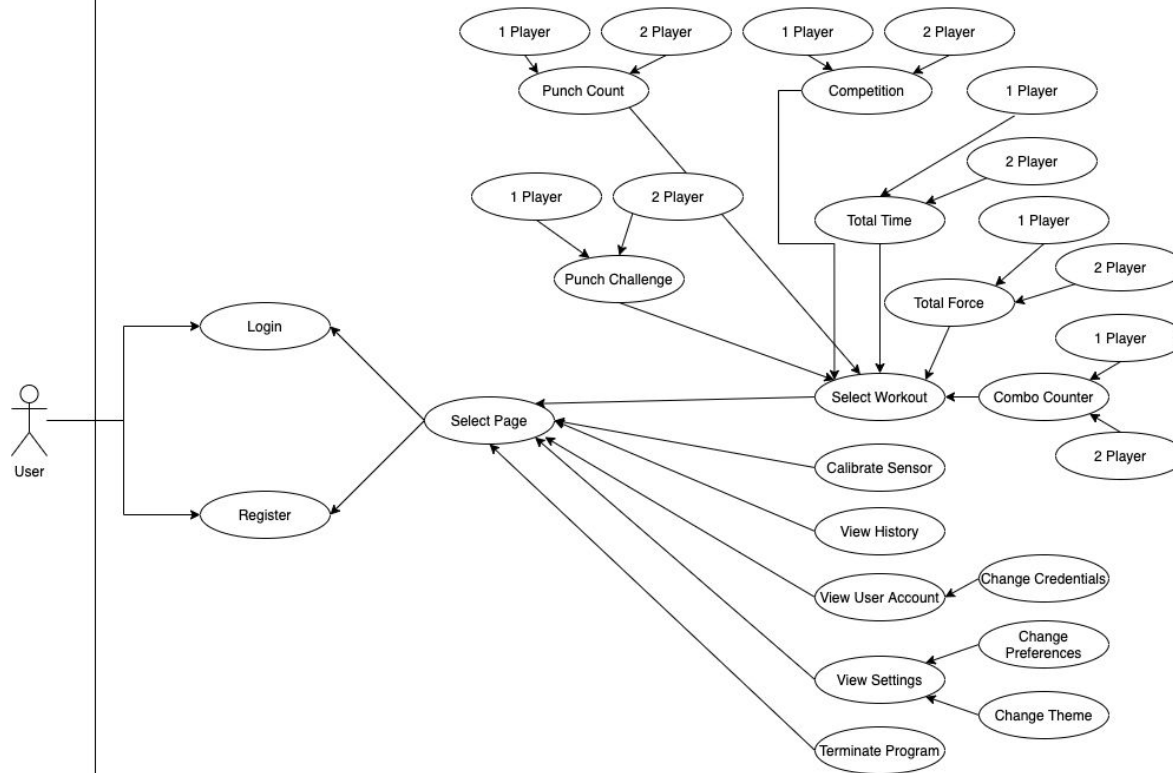


Requirements: User Stories

Name	User Story	Acceptance Criteria	Contributor
Combo Counter Heavy Bag 7	As a developer I would like to access the database from all classes using a single object	All the database code is contained in a single class and other classes reference that one object to gain access to the database	Daniel Mato
Combo Counter Heavy Bag 20	As a User I would like be able to choose themes and color scheme	User has an option to choose between preset themes	Calvin Mark
Combo Counter Heavy Bag 26	As a user I would like to see visual feedback from the application when the bag is struck to make sure my hits are registered	User can see a visual display of force when bag is hit	Daniel Mato
Combo Counter Heavy Bag 32	As a developer I would like to interact with the database to make global changes	There is a single class that interacts with the database	Daniel Mato & Calvin Mark
Combo Counter Heavy Bag 33	As a user I would like to have a user settings page to control and save preferences to my profile	User preferences can be chosen and saved	Calvin Mark

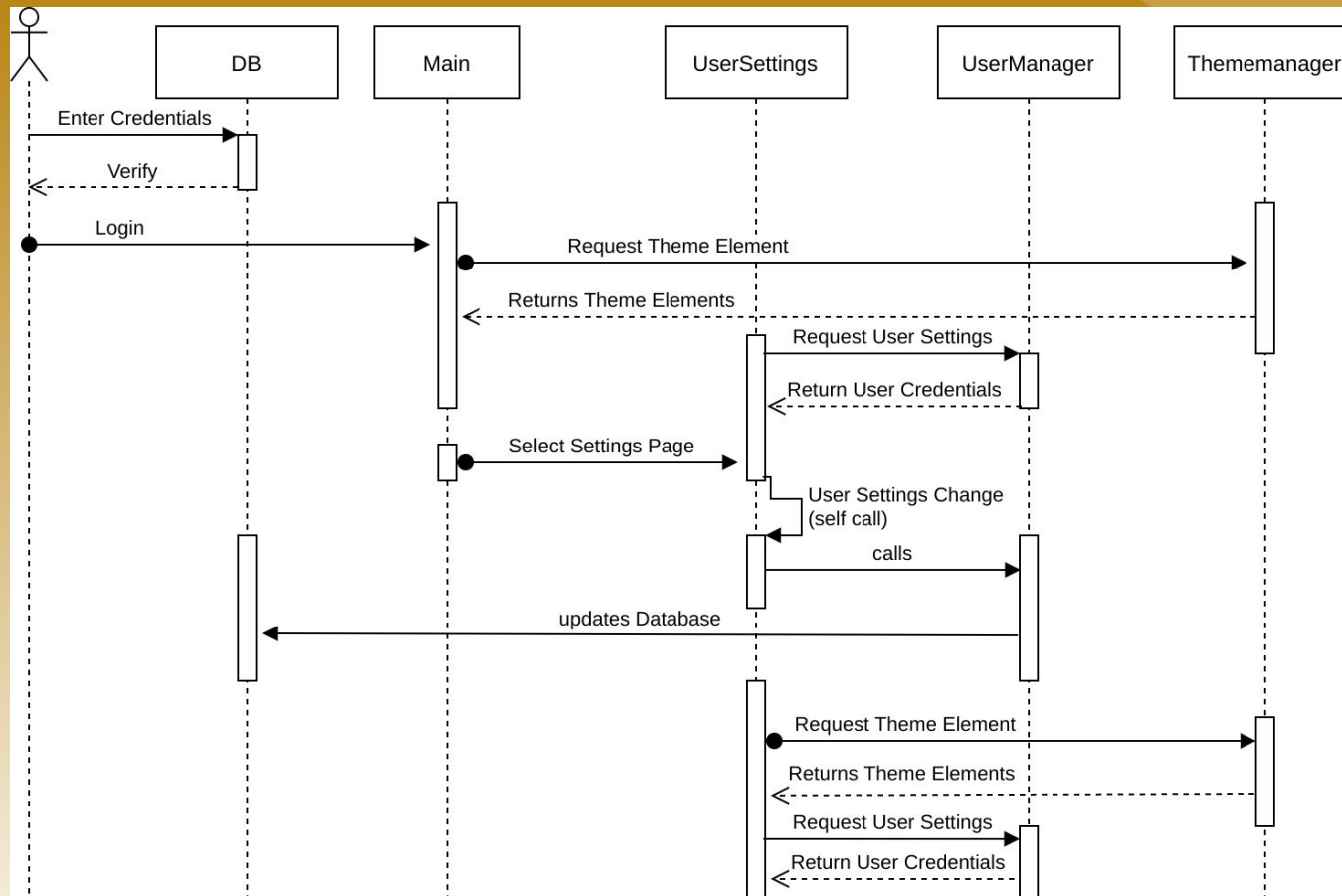
Name	User Story	Acceptance Criteria	Contributor
Combo Counter Heavy Bag 32	As a developer I would like to interact with the database to make global changes	There is a single class that interacts with the database	Daniel Mato & Calvin Mark
Combo Counter Heavy Bag 34	As a developer I would like to have user changes be implemented	The changes made in the user settings page are reflected in the database and are shown when the user reopens the application	Calvin Mark
Combo Counter Heavy Bag 39	As a developer I would like to use a dictionary to change the way pages are stored for easier implementation	The pages that are brought into the main page are stored in a dictionary	Daniel Mato

Use Case

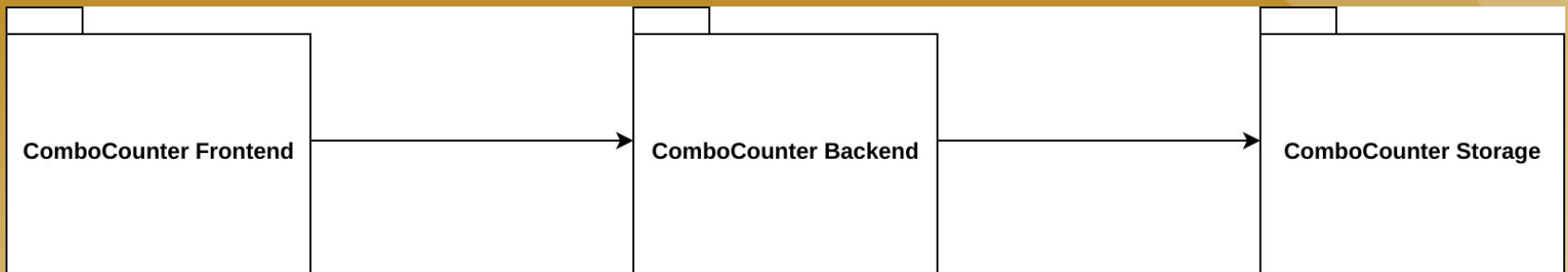


Requirements: Sequence Diagrams

Change Theme

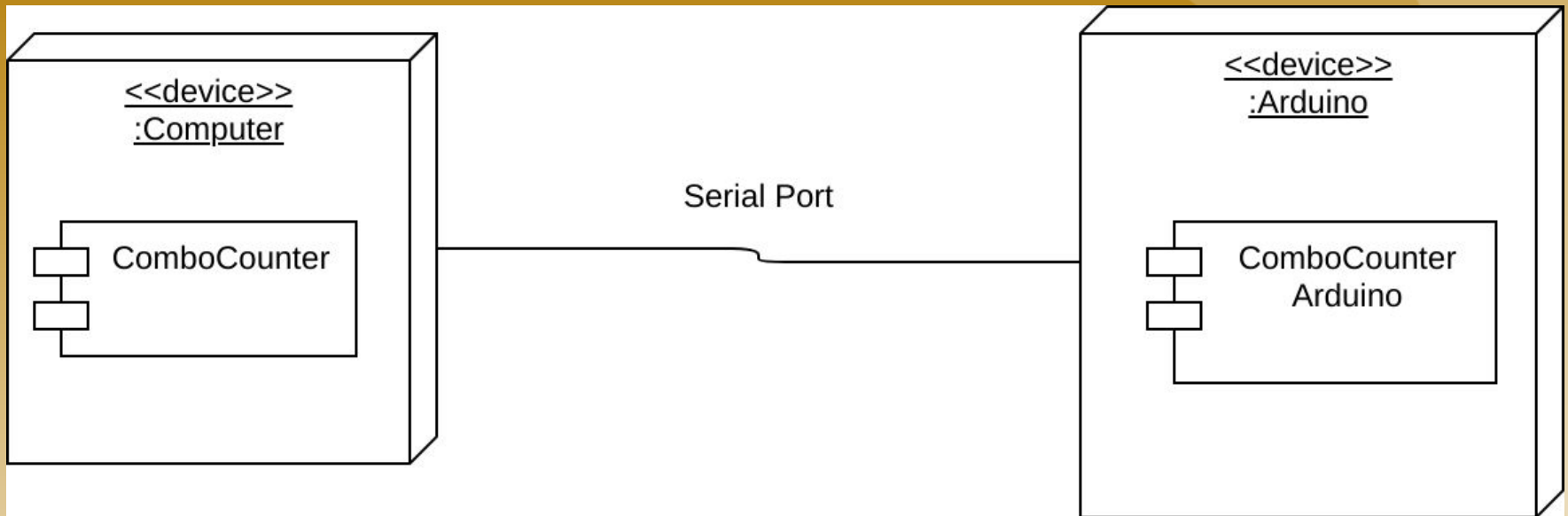


System Design: Architecture



- Our team used a 3 tiered approach
- Even though the Frontend and the Backend are a part of the same application they are treated differently and there is a separation between them
- This separation of tasks is something that we added to the system to make it less tightly coupled

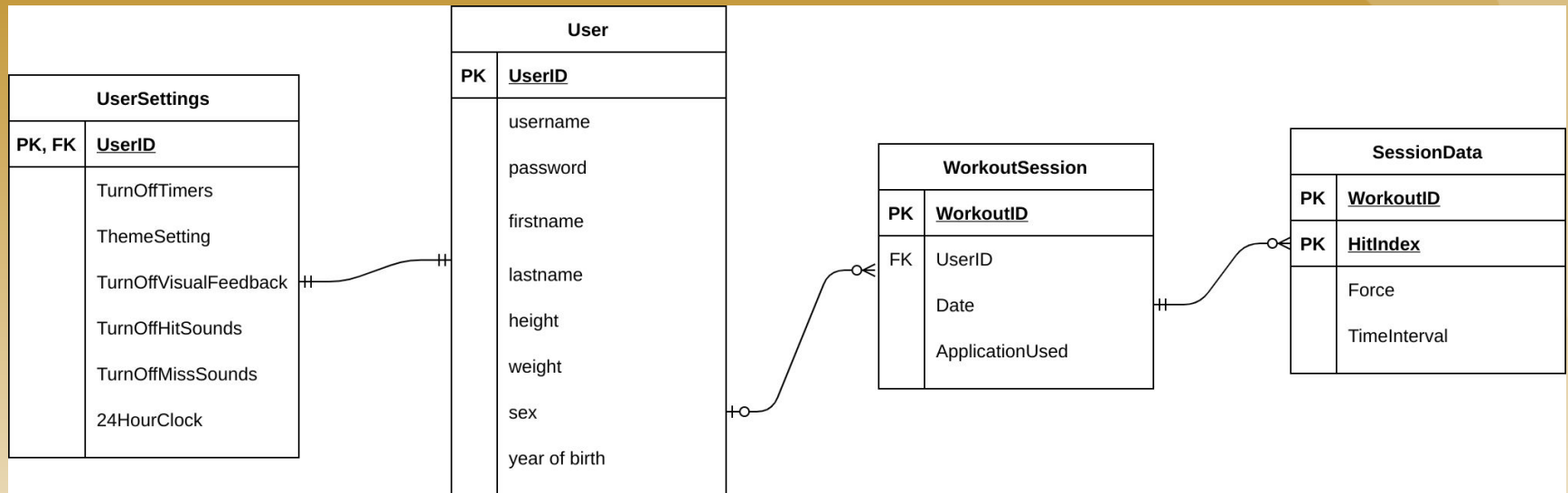
System Design: Deployment



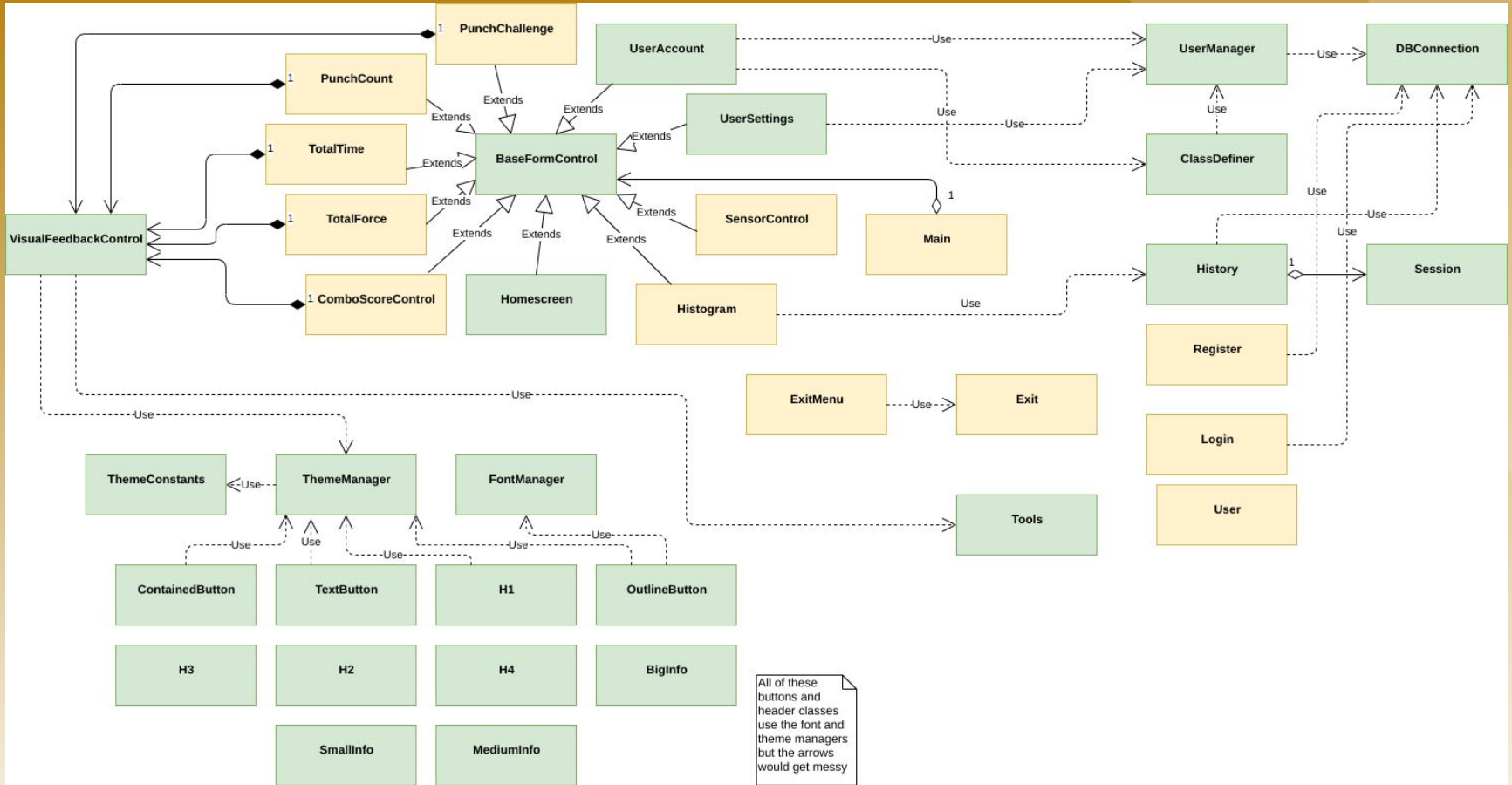
- Due to the COVID-19 pandemic we were unable to meet with the previous team and were unable to retrieve the bag containing the Arduino from them
- Because of this we only dealt with the ComboCounter application on the Computer and did not deal with the Arduino code

System Design

ER Diagram of the Persistent Storage



Minimal Class Diagram



Items in green are new classes and items in yellow are classes we modified

Main algorithm

```
case ClassToCall.ComboCounter:  
    if (!pages.ContainsKey(nameof(ComboScoreControl)) {  
        pages.Add(nameof(ComboScoreControl), new ComboScoreControl());  
    }  
    LoadNewPage(pages[nameof(ComboScoreControl)]);  
    break;
```

- An example of how we are loading the pages in the Main class, each page has an entry in the ClassToCall enumeration

Test Suites and Test Cases

Test Case Id	unitTest_ComboCounter_01
Purpose	CC User Danny Wants to change his theme to dark mode
Pre-conditions	Danny is on the UserSettings page and his theme is not dark
Input	Danny clicks on the “Dark Mode Theme” Button
Expected Output	The application changes themes to the dark mode, Danny’s theme selection is updated in the database
Status	Pass

Test Case Id	unitTest_ComboCounter_02
Purpose	CC User Calvin wants to view his previous workouts
Pre-conditions	Danny is on the main page, has a valid account, has previous workouts in the database
Input	Danny clicks on the History icon on the top bar
Expected Output	The application navigates to the history page and Danny’s previous workouts are shown with the correct data
Status	Pass

Test Case Id	unitTest_ComboCounter_03
Purpose	CC User Danny wants to change his first name to Daniel
Pre-conditions	Danny is on the User Account page, has a valid account
Input	Danny presses the edit button, inputs 'Daniel' into the First Name field, and presses the submit button
Expected Output	Danny's first name is updated in the database to be Daniel
Status	Pass

Test Case Id	unitTest_ComboCounter_04
Purpose	CC User Calvin wants to terminate instance
Pre-conditions	Calvin is on any page of a running instance
Input	Calvin presses the exit button
Expected Output	Program is terminated
Status	Pass

Test Case Id	unitTest_ComboCounter_05
Purpose	CC User wants to mute audio feedback
Pre-conditions	User hears audio feedback during workouts
Input	User navigates to User settings page and unchecks box to mute the desired sounds
Expected Output	Corresponding checkbox shoes reflects changed box. Program does not output any audio during workout session
Status	Pass

Test Case Id	unitTest_ComboCounter_06
Purpose	CC Developer want to ensure there is only one instance of each page
Pre-conditions	Combo Counter must be running
Input	Any Icon is pressed multiple time in sequence (<i>user settings icon is selected for the purpose of this test</i>)
Expected Output	Task Manager shows a single instance of selected page
Status	Pass

Summary

To add improvements upon the foundation of the previous version. The database has been restructured to be more efficient. New columns were added to implement new features. Additionally, improvements were made to the overall user experience such that the application can be more responsive to user interaction while being tailored to the users preferences.

Improvement Details

- **Improved functionality & UI/UX:**
 - Dynamic Themes
 - Added fonts to the UI to avoid using the default Windows fonts
 - Added visual feedback to the workout applications
 - Standardized UI elements throughout the program
 - Standard coloring of elements
 - Removed low quality elements
 - Elements are now centered
 - Added Icons to better describe feature to user
- **Database Improvements:**
 - Database code was spread out throughout the application but is now contained in one class
 - Restructured Database to implement new features
 - User can now interact with database to make changes to User Account
 - Added a system to track workout sessions and keep track of the history of workouts
 - Added User Settings to allow the user some level of customization of the program
- **Bug fixes:**
 - Fixed bug creating multiple instances of pages
 - User was originally unable to exit or quit application
 - Fixed a bug where the program would incorrectly calculate the time if the start button was pressed multiple times
 - Some applications would create multiple timers causing race conditions which would make the time shown to be inaccurate
 - Double Clicking would cause strange behavior, resulting in loss of data
 - Changed the paths for sound effects to be relative instead of absolute to make it less user specific
 - Moved commonly used functions to a static tools class to remove code duplication

Closing

- Questions?
- Contact Info
 - Daniel Mato: dmato011@fiu.edu
 - Calvin Mark: cmark013@fiu.edu