WattFarm

Final Test Results

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1 INTRODUCTION

This document presents the results of all of the different methods of testing that were done on the product, *WattFarm.* It outlines the three types of methods used; unit testing, scope testing, and functional testing. It includes a description of how each component was tested individually in order to ensure the software was working properly.

2 UNIT TESTING

2.1 Description and Overview

Due to the graphical/visual nature of some of most of the product, unit testing was used primarily to test Database functionality. The unit testing was done using JUnit testing in the Eclipse IDE. Using these two softwares allowed code coverage to be measured with the EclEmma plugin for Eclipse.

2.2 Code Coverage Breakdown

As stated, the code coverage was measured with the EclEmma plugin for Eclipse. Due to certain return types and graphics components, only the Session class was able to be effectively tested using Unit Testing.

To Unit Test the Session class, JUnit tests were used. All of the testing methods are included in the source code of this project, and the results of the testing can been seen in the screenshot of EclEmma in Appendix A.

Component	Test Results
Getters and Setters	All getters and setter work
addUser	Database can a user's login information
isUser	Database able to check on a user's status
logInCoach/logInRower	Session class correctly updates the static id fields based on the user
Coach Database Interactions	Software can successfully edit and insert data into all Coach-related tables

Coach Database Interactions	Software can successfully edit and insert data into all Rower-related tables
Team Database Interactions	Software can successfully edit and insert data into all Team-related tables
Workout Database Interactions	Software can successfully edit and insert data into all Workout-related tables

2.3 Challenges and Setbacks

Unit testing proved to be difficult and not very useful when it came to testing the components. Due to the nature of the project (especially because of its implementation of JDBC databases and graphics), unit testing was not well suited. Despite this, JUnit testing did provide the ability to test the Session class effectively.

3 FUNCTIONAL TESTING

3.1 Description and Overview

The majority of the testing done for *WattFarm* was functional testing. This was the easiest and most effective way to interact with both the GUI and the database implementation. The testing was broken down first into five sub-systems: login, rower, coach, graphics, and database. Then, those subsystems were tested on a component basis based on functionality and features.

3.2 TESTING RESULTS BY COMPONENT

Login:

Component	Test Results

LoginSys	• Login window displays properly • Login window is sized correctly • Login window is positioned correctly • Login window contents is properly displayed • The logo is displayed within the window • All fields and buttons are correctly positioned • Login window components function correctly • Username Field accepts entry • Password Field accepts entry • Radio buttons are selectable/dependent • Login button triggers login process • Create new login button triggers create login process
CreateLogin	• Create Login window displays properly • Create Login window is sized correctly • Create Login window is positioned correctly • Create Login window contents is properly displayed • All fields and buttons are correctly positioned • Create Login window components function correctly • Username Field accepts entry • Password Field accepts entry • Radio buttons are selectable/dependent • Create button triggers create user process • Back to login button navigates back

Rower:

Component	**Test Results**
RowerMainMenu	• Main Menu window displays properly • Main Menu window is sized correctly • Main Menu window is positioned correctly • Main Menu window contents is properly displayed • All fields and buttons are correctly positioned • Main Menu window components function correctly • Graphics button loads graphics page • Profile button loads Profile Page • Workouts button loads Workouts Menu

WorkoutsMenu	• Workouts Menu window displays properly • Workouts Menu window is sized correctly • Workouts Menu window is positioned correctly • Workouts Menu window contents is properly displayed • All fields and buttons are correctly positioned • Workouts Menu window components function correctly • New Workout button loads New Workout Page • Edit button loads Edit Workout Page • View button loads View Workouts page • Main Menu button returns user to Main Menu
New Workout	• New Workout Page window displays properly • New Workout Page window is sized correctly • New Workout Page window is positioned correctly • New Workout Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • New Workout Page window components function correctly • All fields accept data entry • All spinners have correct min/max/step/initial values • Enter Workout button correctly triggers enter workout process
Edit Workout	• Edit Workout Page window displays properly • Edit Workout Page window is sized correctly • Edit Workout Page window is positioned correctly • Edit Workout Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Edit Workout Page window components function correctly • Workout Spinner correctly displays all valid workouts • Confirm button goes to edit page • All spinners have correct min/max/step/initial values • Enter Workout button correctly triggers edit workout process

View Workouts	• View Workouts Page window displays properly • View Workout Page window is sized correctly • View Workout Page window is positioned correctly • View Workout Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Table is formatted correctly and displays correct content • View Workout Page window components function correctly • Edit Workout button goes to Edit Workout Page • Main Menu button foes to Main Menu
Profile Page	• Profile Page window displays properly • Profile Page window is sized correctly • Profile Page window is positioned correctly • Profile Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Correct information is displayed • Profile Page window components function correctly • Edit Profile button loads Edit Profile page • Main Menu button loads Main Menu
Edit Rower Profile Page	• Edit Profile Page window displays properly • Edit Profile Page window is sized correctly • Edit Profile Page window is positioned correctly • Edit Profile Page Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Correct information is displayed • Edit Profile Page window components function correctly • Confirm button starts edit rower profile process
Graphics Page	• Graphics window displays properly • Graphics Page window is sized correctly • Graphics Page window is positioned correctly • Graphics Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Correct information is displayed on spinners • Graphics Page window components function correctly • Generate Graphic button generates a graphic • Main Menu button goes back to main menu

Coach:

Component	Test Results
CoachMainMenu	• Main Menu window displays properly ◦ Main Menu window is sized correctly ◦ Main Menu window is positioned correctly • Main Menu window contents is properly displayed ◦ All fields and buttons are correctly positioned • Main Menu window components function correctly ◦ Graphics button loads graphics page ◦ Profile button loads Profile Page ◦ Workouts button loads Workouts Menu ◦ Team Button loads team page
WorkoutsMenu	• Workouts Menu window displays properly ◦ Workouts Menu window is sized correctly ◦ Workouts Menu window is positioned correctly • Workouts Menu window contents is properly displayed ◦ All fields and buttons are correctly positioned • Workouts Menu window components function correctly ◦ View button loads View Workouts page ◦ Main Menu button returns user to Main Menu
View Workouts	• View Workouts Page window displays properly ◦ View Workout Page window is sized correctly ◦ View Workout Page window is positioned correctly • View Workout Page window contents is properly displayed ◦ All fields and buttons are correctly positioned ◦ All labels are correct ◦ Table is formatted correctly and displays correct content • View Workout Page window components function correctly ◦ Main Menu button goes to Main Menu
Profile Page	• Profile Page window displays properly ◦ Profile Page window is sized correctly ◦ Profile Page window is positioned correctly • Profile Page window contents is properly displayed ◦ All fields and buttons are correctly positioned ◦ All labels are correct ◦ Correct information is displayed • Profile Page window components function correctly ◦ Edit Profile button loads Edit Profile page ◦ Main Menu button loads Main Menu

Edit Coach Profile Page	• Edit Profile Page window displays properly • Edit Profile Page window is sized correctly • Edit Profile Page window is positioned correctly • Edit Profile Page Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Correct information is displayed • Edit Profile Page window components function correctly • Confirm button starts edit coach profile process
Graphics Page	• Graphics window displays properly • Graphics Page window is sized correctly • Graphics Page window is positioned correctly • Graphics Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Correct information is displayed on spinners • Graphics Page window components function correctly • Generate Graphic button generates a graphic • Main Menu button goes back to main menu
Team Menu	• Team Menu window displays properly • Team Menu window is sized correctly • Team Menu window is positioned correctly • Team Menu window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Team Menu window components function correctly • View Team button goes to View Team page • Create Team button goes to create team page • Main menu button goes back to main menu
View Team Page	• View Team Page window displays properly • View Team Page window is sized correctly • View Team Page window is positioned correctly • View Team Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Table is formatted correctly and displays correct content • View Team Page window components function correctly • Main Menu button goes to Main Menu

Create Team Page	• Create Team Page window displays properly • Create Team Page window is sized correctly • Create Team Page window is positioned correctly • Create Team Page window contents is properly displayed • All fields and buttons are correctly positioned • All labels are correct • Create Team Page window components function correctly • Create button starts create team process • Main Menu button goes to Main Menu

Graphics:

Component	**Test Results**
Create Plot	• Plot window displays properly • Plot window is sized correctly • Plot window is positioned correctly • Graphics Page window contents is properly displayed • Axis scaled and marked properly based on values • All values graphed w/ correct x and y scaling • Line connects all points • Colors are correct

Database:

Component	**Test Results**
ROWER_LOGIN	• Login information can be created • Login information can be checked • rowerID autoincrements and is unique key
COACH_LOGIN	• Login information can be created • Login information can be checked • coachID autoincrements and is unique key
ROWERS	• Rower user information can be created • Rower information can be checked • Rower profile information can be accessed and edited • Rower profile can be exported to JTable format
COACHES	• Coach user information can be created • Coach information can be checked • Coach profile information can be accessed and edited • Coach profile can be exported to JTable format

WORKOUTS	• WorkoutID auto increments and is unique key • Workouts can be created • Workout information can be checked • Workout information can be edited and accessed • Workouts can be exported to JTable and JPanel formats • Workout values for graphing are returned in right order
TEAMS	• TeamID auto increments and is unique key • Teams can be created and edited • Team's coachID can be accessed and edited

4 SCOPE TESTING

4.1 Description and Overview

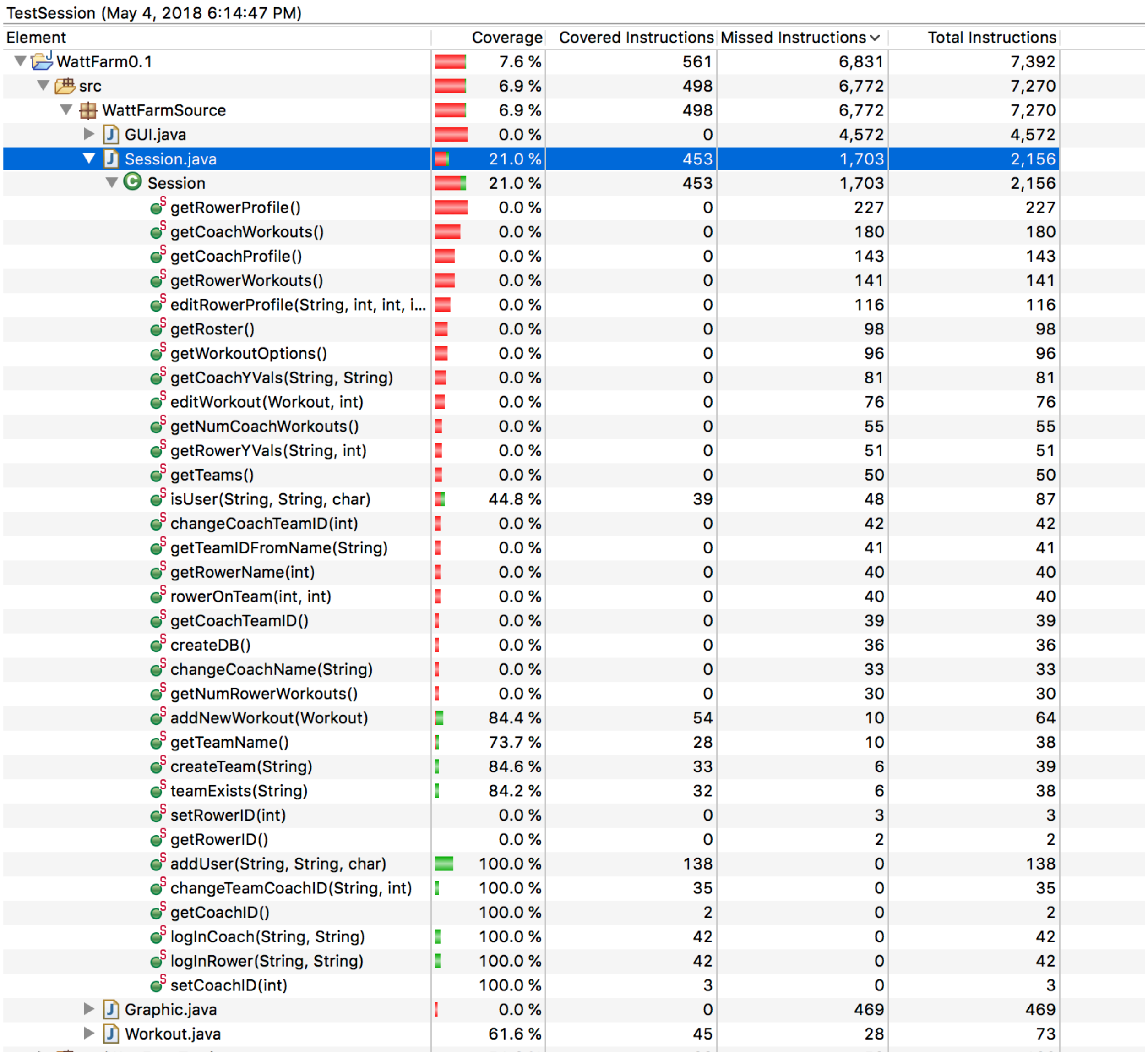
Due to the software having input fields, database restrictions, and login profiles it was important to test the scope of those components to make sure users couldn't break the system. Scope testing was done throughout development and features were implemented to restrict inputs so that no inappropriate data types or invalid values could be used. For all JSpinner selection fields, min/max/step/initial values were used to allow users to only enter valid data.

4.2 Description and Overview

Component	Test Results
Login Sys	• Username and Password fields do not accept blank values • Username and Password fields must match an existing login (with corresponding user type) to log in • Exactly one user type is selected
Create User	• Username and Password fields do not accept blank values • Username must be unique to create a new login • Exactly one user type is selected
Rower Graphic	• Graphics menu is only loaded if there are at least two valid workouts logged (can't plot 0 or 1 points)
Edit Workout	• Edit page only available if at least 1 workout logged • Workout selection spinner only gives user options of workouts that have been logged
New Workout	• Correctly formatted spinners

Edit Rower Profile	• Rower can only select a team that has been created
Create Team	• Coaches cannot create a team that already exists
Edit Coach Profile	• Rower can only select a team that has been created
View Workout	• Only created workouts can be viewed (for Rower and Coach)

APPENDIX A: CODE COVERAGE



TestSession (May 4, 2018 6:14:47 PM)

Element	Coverage	Covered Instructions	Missed Instructions	Total Instructions
▼ WattFarm0.1	7.6 %	561	6,831	7,392
▼ src	6.9 %	498	6,772	7,270
▼ WattFarmSource	6.9 %	498	6,772	7,270
▶ GUI.java	0.0 %	0	4,572	4,572
▼ Session.java	21.0 %	453	1,703	2,156
▼ Session	21.0 %	453	1,703	2,156
getRowerProfile()	0.0 %	0	227	227
getCoachWorkouts()	0.0 %	0	180	180
getCoachProfile()	0.0 %	0	143	143
getRowerWorkouts()	0.0 %	0	141	141
editRowerProfile(String, int, int, i...	0.0 %	0	116	116
getRoster()	0.0 %	0	98	98
getWorkoutOptions()	0.0 %	0	96	96
getCoachYVals(String, String)	0.0 %	0	81	81
editWorkout(Workout, int)	0.0 %	0	76	76
getNumCoachWorkouts()	0.0 %	0	55	55
getRowerYVals(String, int)	0.0 %	0	51	51
getTeams()	0.0 %	0	50	50
isUser(String, String, char)	44.8 %	39	48	87
changeCoachTeamID(int)	0.0 %	0	42	42
getTeamIDFromName(String)	0.0 %	0	41	41
getRowerName(int)	0.0 %	0	40	40
rowerOnTeam(int, int)	0.0 %	0	40	40
getCoachTeamID()	0.0 %	0	39	39
createDB()	0.0 %	0	36	36
changeCoachName(String)	0.0 %	0	33	33
getNumRowerWorkouts()	0.0 %	0	30	30
addNewWorkout(Workout)	84.4 %	54	10	64
getTeamName()	73.7 %	28	10	38
createTeam(String)	84.6 %	33	6	39
teamExists(String)	84.2 %	32	6	38
setRowerID(int)	0.0 %	0	3	3
getRowerID()	0.0 %	0	2	2
addUser(String, String, char)	100.0 %	138	0	138
changeTeamCoachID(String, int)	100.0 %	35	0	35
getCoachID()	100.0 %	2	0	2
logInCoach(String, String)	100.0 %	42	0	42
logInRower(String, String)	100.0 %	42	0	42
setCoachID(int)	100.0 %	3	0	3
▶ Graphic.java	0.0 %	0	469	469
▶ Workout.java	61.6 %	45	28	73