MASTER TEST DOCUMENT

for

Personal Dietary Application

Version 1.0

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Contents

1 Introduction

This master testing document describes the strategies and tools we (Team 4) used to test the Personal Dietary Manager application. This testing document serves as the deliverable document for iteration 3 of the class project in COMP 5541 at Concordia Univeristy. Iteration 3 is the final iteration of of Personal Dietary Manager, and implements database functionality using MySQL.

Associated with this test plan are documents delivered in iteration 1 and iteration 2 of this project. These are, respectively, the Software Requirements Specifications (SRS) and Design Documents (DD). This test plan will refer to these other documents for the purpose of traceability.

1.1 Purpose

The purpose of this test plan is to verify the quality and correctness of the Personal Dietary Manager application. Correctness is the state in which the application satisfies the SRS and delivers a product that can accurately track a dietary regimen. Quality is the state in which the application delivers a user-friendly experience that is free of bugs, runs fast, and runs smoothly.

As no software project is perfect, any outstanding bugs and issues will also be discussed.

1.2 Scope

The scope of this test document are the tools are strategies that are used for testing. These are:

- Unit testing
- Integration and Module Testing
- Functional Testing
- User Interface Testing

Tests that are outside of the scope of this document are load, configuration and installation, business analysis, network security, and stress testing.

1.3 Document Terminology and Acronyms

Abbreviation	Term
MVC	Model View Controller
GUI	Graphical User Interface
UML	Unified Modeling Language
PDA	Personal Dietary Application
GRASP	General Responsibility Assignment Software Patterns

1.4 References

- Dr. Nora Houari, 2020, "COMP 5541 Course Notes" including:
  - Introduction to testing
  - Tutorial: Testing
  - Project Information
  - Montrealopoly Master Test Plan
- Pressman, R.S. (2009). Software Engineering: A Practitioner's Approach, 7Th Edition.
- ISO/IEC/IEEE International Standard - Software and systems engineering – Software testing –Part 3: Test documentation," in ISO/IEC/IEEE 29119-3:2013(E) , vol., no., pp.1-138, 1 Sept. 2013

2 Evaluation Mission Test Motivation

The purpose of this test document is to ensure the personal dietary desktop application meets the design requirements mandated by the course objectives outlined in the project specification document and system requirements document. This document will be a tool to outline test cases and keep a quality assurance guideline for the software development team. Lastly, the 'team 4' group will deliver an exceptional piece of quality software.

2.1 Background

The graduate diploma course COMP 5541 mandated a personal dietary application be developed as part of a group project for the semester. The third increment of this project involved implementing a database for use with the desktop application. A remote database server offered by Microsoft, Azure, is utilized. The Java programming language and GUI library JavaFX. A comprehensive testing environment has been created to make sure the software is completed without any major issues or bugs.

This test document outlines several testing methods and processes that were used to verify the software is without serious bugs. The previous document included, the design document, had the software architecture and design pattern specifications. The initial document, the requirements document, contained the class diagrams, use case diagrams, and the purpose and demands the software is intended to fulfill.

2.2 Evaluation Mission

The principal goals of this document are evaluated as the following:

- Making sure that the design document quality is adhered to.
- Guaranteeing the software requirement document specifications are completed.
- That any major software bugs are not found in the application.

The test plan document will be used as a tool to make sure these missions are accomplished.

2.3 Test Motivators

The areas explored in this testing document are the following:

Unit Testing: A set number of methods are tested to verify their inputs and outputs meet the specifications. White and black box testing methods are used.
Integration and Module Testing: The classes and objects are tested together to see if behavior remains consistent.
Functional Testing: Makes sure that use cases objectives are accomplished.
User Interface Testing: The GUI that the user interacts with is checked for malfunctions.

3 Outline of Planned Tests

This section provides an overview of the four types of tests that we will do: unit testing, integration and module testing, functional testing, and user interface testing. A brief description of each is described.

We frequently distinguish our testing strategies between white- and black-box testing. White-box testing tests the internal structures of an application (e.g. source code, classes, methods). Conversely, black-box testing tests the external functions that the software is supposed to perform, and does not necessarily examine the underlying source code.

3.1 Unit Testing

The primary focus of unit testing is performing isolated tests on specific methods in the system. We we will be using white box testing techniques to iterate through the paths the methods take to execute their instructions. The following list of methods is not every method present in the software application however they are the most crucial. For a complete list of the methods please see the design document. Here are the methods included in this document which are tested:

- Method createDining
- Method deleteDining
- Method findDiningByName
- Method createMeal
- Method createRetailer

3.2 Integration and Module Testing

The integration and module testing will verify that the classes and methods work together as a larger system. There is only one main window for the personal dietary application. Both bottom up and top down testing are used when describing the test cases and their results for the functionality available to the user in the main window. From the main window, every piece of the model view controller (MVC) model is coordinated to deliver the appropriate software functionality.

3.3 Functional Testing

Functional testing is a form a black-box testing in which the application use cases are tested. These use cases can be found both in the SRS and the Project Infromation class notes document. In other words, the functional requirements of the project are tested for correctness.

3.4 User Interface Testing

User interface (UI) testing involves testing the various parts of the GUI for correctness and quality. These GUI parts include the text fields, comboboxes, observable lists, list views, table views, buttons, etc. UI testing is a form of black-box testing.

4 Test Approach

4.1 Unit Testing

Individual methods are tested here, in the unit testing portion of the testing phase. The methods have been integrated to perform with the latest increment of the development for this personal dietary application. Therefore, they have database functionality.

4.1.1 createDiningTest()

The createDining() method initialized a Dining item to be added to an observable list. This list keeps track of all the dining items input by the user. The Dining items are also added to the database.

```
public void createDiningTest() throws SQLException {
        DiningDAO diningDAO= new DiningDAOImp();
        FoodGroup foodGroup=new FoodGroup("vegetables_and_fruits");
        foodGroup.setFoodGroupId(1);
        Meal meal=new Meal("coffee");
        meal.setMealId(3);
        Type type=new Type("homemade");
        type.setTypeId(1);
        Retailer retailer=new Retailer("McDonald");
        retailer.setRetailerId(4);
        Serving serving = new Serving("1 cup", 10, 10, 10, 10);

        Indining indining=new Indining();
        indining.setName("testIndining");
        indining.setConsumed(false);
        indining.setFoodGroup(foodGroup);
        indining.setMeal(meal);
        indining.setTime(LocalDateTime.now());
        indining.setType(type);
        indining.setServing(serving);

        int inResult = diningDAO.createDining(indining);
        Dining inFound= diningDAO.findDiningById(indining.getDiningId());

        Serving serving2 = new Serving("1 cup", 20, 20, 20, 20);
        Outdining outdining=new Outdining();
```

```
    outdining.setName("testOutdining");
    outdining.setConsumed(false);
    outdining.setFoodGroup(foodGroup);
    outdining.setMeal(meal);
    outdining.setTime(LocalDateTime.now());
    outdining.setRetailer(retailer);
    outdining.setServing(serving2);
    int outResult = diningDAO.createDining(outdining);
    Dining outFound= diningDAO.findDiningById(outdining.getDiningId());

    assertEquals("T0---Create Dining", 1, inResult);
    assertEquals("T0---createInDiningTest", inFound, indining);
}
```

Unit test case passes.

4.1.2 deleteKnownDiningTest()

The delete method removes the dining item from the list and from the database.

```
public void deleteKnownDiningTest() throws SQLException {
    DiningDAO diningDAO= new DiningDAOImp();
    int result = diningDAO.deleteDining(31);
    assertEquals("T30---deleteKnownDiningTest: ", 1, result);
}
```

Unit test case passes.

4.1.3 findFoodGroupByNameTest()

Every food item has an associated food group. This method will find the food group that has been associated to the food item.

```
public void findFoodGroupByNameTest() throws SQLException {
    FoodGroupDAO foodGroupDAO= new FoodGroupDAOImp();
    String name="grain_products";
    FoodGroup foodGroup =foodGroupDAO.findFoodGroupByName(name);
    assertEquals("T3---findFoodGroupByName: ", name, foodGroup.getFoodGroupName());
}
```

Unit test case passes.

4.1.4 createMealTest()

The createMeal() method instantiates the necessary meal object to be used in the software application. The data given by the user indicates what kind of meal object to create with dedicated attributes.

```
public void createMealTest() throws SQLException {
     MealDAO mealDAO= new MealDAOImp();
     Meal meal1=new Meal(), meal2 = new Meal();
     meal1.setMealName("test7");
     meal2.setMealName("test8");

     int result = mealDAO.createMeal(meal1);
     int result2 = mealDAO.createMeal(meal2);
     Meal found= mealDAO.findMealById(meal1.getMealId());
     Meal found2 = mealDAO.findMealById(meal2.getMealId());
     assertEquals("T0---Create Meal", 1, result);
     assertEquals("T0---Create Meal", 1, result2);
     assertEquals("T0---CreateMealTest", found, meal1);
     assertEquals("T0---CreateMealTest", found2, meal2);
}
```

Unit test case passes.

4.1.5 createRetailerTest()

For an out dining object, the createRetailer() method will instantiate the necessary retailer object. The data is fed to the database as necessary.

```
public void createRetailerTest() throws SQLException {
    RetailerDAO retailerDAO= new RetailerDAOImp();
    Retailer retailer=new Retailer();
    retailer.setRetailerName("test3");

    int result = retailerDAO.createRetailer(retailer);
    Retailer found= retailerDAO.findRetailerById(retailer.getRetailerId());
    assertEquals("T0---Create retailer", 1, result);
    assertEquals("T0---CreateRetailerTest", found, retailer);
}
```

Unit test case passes.

4.2 Integration and Module Testing

The integration and module testing observes, tests, and sees how different parts of the application operate together.

The personal dietary application has several modules that work together to form a Model-View-Controller (MVC) architecture. There is only one window, the main window, from which all operations can be performed. Several test cases were reviewed to ensure the overall architecture of the application is well integrated and working properly.

4.2.1 Main Window

Test Case 1	Application opens to main window
Test Case Description	Test to see if the main window opens. This test case is performed when the program is run.
Result	Passed

Test Case 2	Data is read from text boxes
Test Case Description	When the application is launched with the main window visible, test to see if the text boxes on the left hand side can read input.
Result	Passed

Test Case 3	Events are handled by controller
Test Case Description	Several events are initiated by the various buttons the user can interact with in the main window. Attempt to test them by using their operations.
Result	Passed

Test Case 4	Information is saved to database
Test Case Description	The items recorded by the application are transferred from main memory to the database. Tested by adding items with the provided buttons.
Result	Passed

Test Case 5	Necessary data is loaded from database
Test Case Description	After saving data in the system, close the application and relaunch the application to observe if data is still present.
Result	Passed

4.3 Functional Testing

In this section we outline the tests done for the functional requirements (a.k.a use cases).
A list of these use cases can be found in the SRS and Project Information class notes.

4.3.1

Use Case	View a list of all foods in diet
Description	The user is able to view a list of foods (both consumed and not consumed)
Preconditions	The user has entered food items into list
Postconditions	A list of foods is displayed on the center portion of the application
Comments	Test sucessful

4.3.2

Use Case	Add a new food item
Description	A new food item is added to the list of foods
Preconditions	The user has inputted all text fields with appropriate data
Postconditions	A new food item appears at the end of the displayed food list
Comments	Test sucessful

4.3.3

Use Case	Mark a food group as eaten or not eaten
Description	A food group will be marked as eaten if a food item is consumed of that group. It will be marked not eaten if there are no consumed food items in that group
Preconditions	The presence, or not, of food items in the food list
Postconditions	The appropriate food group box will light up at the bottom of the application
Comments	Test sucessful

4.3.4

Use Case	Mark a food group as eaten or not eaten
Description	A food group will be marked as eaten if a food item is consumed of that group. It will be marked not eaten if there are no consumed food items in that group
Preconditions	The presence, or not, of food items in the food list
Postconditions	The appropriate food group box will light up at the bottom of the application
Comments	Test sucessful

4.3.5

Use Case	Remove a food item
Description	A food item in the food list is removed
Preconditions	One or more food items are in the food list
Postconditions	The selected food item is removed from the food list
Comments	Test sucessful

4.3.6

Use Case	Sort the food list based on a food attribute (e.g. serving, time, food group)
Description	The list of foods is sorted based on a given food attribute
Preconditions	Two or more food items are in the food list
Postconditions	The foods in the food list are sorted in ascending or descending order based on the attribute
Comments	Test sucessful

4.3.7

Use Case	Set a food item as consumed or not consumed
Description	The user is able to select in the list of foods which ones are consumed or not consumed
Preconditions	One or more food items are in the food list
Postconditions	A food item is marked as consumed or not consumed. The total nutrients in the consumed food list is appropriately updated.
Comments	Test sucessful

4.3.8

Use Case	Choose a food item as either indining or outdining
Description	The user is able to select if the food item has either an indining or outdining food attribute
Preconditions	The user has entered corrected all values in the text areas
Postconditions	A food item is entered into the food list with either an indining or outdining food attribute
Comments	Test sucessful

4.3.9

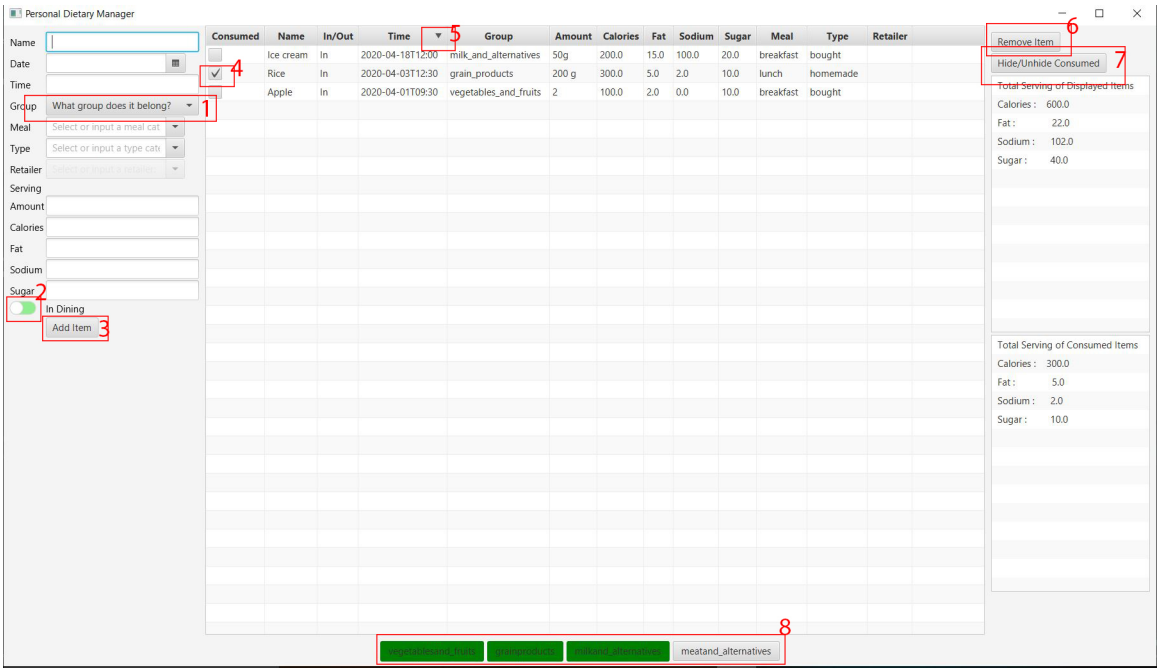
Use Case	View only consumed food items, or view all food items
Description	The user is able to view either consumed food items, or a list of all food items (consumed and not consumed)
Preconditions	Two or more food items are in the food list
Postconditions	Either all food items will be displayed, or only consumed food items
Comments	Test sucessful

4.3.10

Use Case	The food list will persist after application closes
Description	The food list is automatically saved in a database after a food item is added or deleted. The food list is restored upon opening the application
Preconditions	The user has previously added or removed food items
Postconditions	The food list which existed before closing the application is restored upon opening the application.
Comments	Test sucessful

4.4 User Interface Testing

In this section we outline some of the user interface components and fields and test their functionality with an application to their associated use case.



4.4.1 Image 1: Food group combo box

Use Case	4.3.2 Add a food item
Description	Drop down menu to select food group of added item
Preconditions	Application is open; data has been properly entered
Postconditions	Food item appears with proper food group
Comments	Test sucessful

4.4.2 Image 2: Indining/outdining toggle switch

Use Case	4.3.8 Choose a food item as either indining or outdining
Description	Toggle between indining and outdining food attribute
Preconditions	Application is open; data has been properly entered
Postconditions	Food item appears with proper indining or outdining attribute
Comments	Test sucessful

4.4.3 Image 3: Food add button

Use Case	4.3.2 Add a food item
Description	Add a food item
Preconditions	Application is open; data has been properly entered
Postconditions	Food item appears with proper food attributes
Comments	Test sucessful

4.4.4 Image 4: Consumed checkbox

Use Case	4.3.7 Set a food item as consumed or not consumed
Description	Checkbox for setting food attribute as consumed or not consumed
Preconditions	Food item is present in center list
Postconditions	Food item appears either as consumed, or not consumed; right-bottom serving box is updated
Comments	Test sucessful

4.4.5 Image 5: Table column button

Use Case	4.3.6 Sort the food list based on a food attribute (e.g. serving, time, food group)
Description	Button to sort (ascending or descending) list of food based on alphanumeric values
Preconditions	Food items are present in center list
Postconditions	Food items appear sorted based on selected attribute
Comments	Test sucessful

4.4.6 Image 6: Remove button

Use Case	4.3.5 Remove a food item
Description	Removes the selected food item from the food list
Preconditions	Food item(s) is present in center list; food item is selected
Postconditions	Selected food item is removed from list
Comments	Test sucessful

4.4.7 Image 7: Hide/Unhide Consumed button

Use Case	4.3.9 View only consumed food items, or view all food items
Description	Shows list of either all food items, or only consumed food items
Preconditions	Food items are present in center list; at least one food item is set to consumed
Postconditions	Either list of all food items, or only consumed food items, is shown; top-right display is updated
Comments	Test sucessful

4.4.8 Image 8: Food group button

Use Case	4.3.3 Mark a food group as eaten or not eaten
Description	Lights up when a food is in the list with the given food attribute
Preconditions	Food items are present in food list
Postconditions	Buttons at bottom are light up with relevant food groups
Comments	Test sucessful

5 Database UML Class Diagram