EYLAH - Developer Guide

1. Introduction . . . 2
   1.1. About EYLAH . . . 2
   1.2. About this guide . . . 2
   1.3. Tips on reading the Developer Guide . . . 3
2. Setting up . . . 3
3. Design . . . 3
   3.1. Architecture . . . 3
   3.2. UI component . . . 6
   3.3. Logic component . . . 7
   3.4. Model component . . . 9
   3.5. Storage component . . . 10
   3.6. Common classes . . . 11
4. Implementation . . . 11
   4.1. Diet Tracker feature . . . 11
   4.2. Expense Splitter feature . . . 43
   4.3. Logging . . . 68
   4.4. Configuration . . . 68
5. Documentation . . . 68
6. Testing . . . 68
7. Dev Ops . . . 68
Appendix A: Product Scope . . . 68
Appendix B: User Stories . . . 69
Appendix C: Use Cases . . . 72
   C.1. Use case: UC14 - Clearing the Receipt when Receipt is undone . . . 80
Appendix D: Non Functional Requirements . . . 81
Appendix E: Glossary . . . 82
Appendix F: Product Survey . . . 83
Appendix G: Instructions for Manual Testing . . . 83
   G.1. Launch and Shutdown . . . 83
   G.2. Adding a Food in Diet Tracker . . . 84
   G.3. Deleting a Food in Diet Tracker . . . 84
   G.4. Editing a Food in Diet Tracker . . . 84
   G.5. Set Dieting Mode In Diet Tracker . . . 85
   G.6. Check User Metrics In Diet Tracker . . . 85
   G.7. Calculate BMI In Diet Tracker . . . 85
   G.8. Store Height In Diet Tracker . . . 86
   G.9. Store Weight In Diet Tracker . . . 86
   G.10. Add Item In Expense Splitter . . . 86

G.11. Delete Item In Expense Splitter . . . 86
G.12. List Receipt in Expense Splitter . . . 87
G.13. List Amount In Expense Splitter . . . 87
G.14. Done Receipt In Expense Splitter . . . 87
G.15. Paid Command In Expense Splitter . . . 87
G.16. Clear Receipt In Expense Splitter . . . 88
G.17. Saving data . . . 88
Appendix H: Effort . . . 88

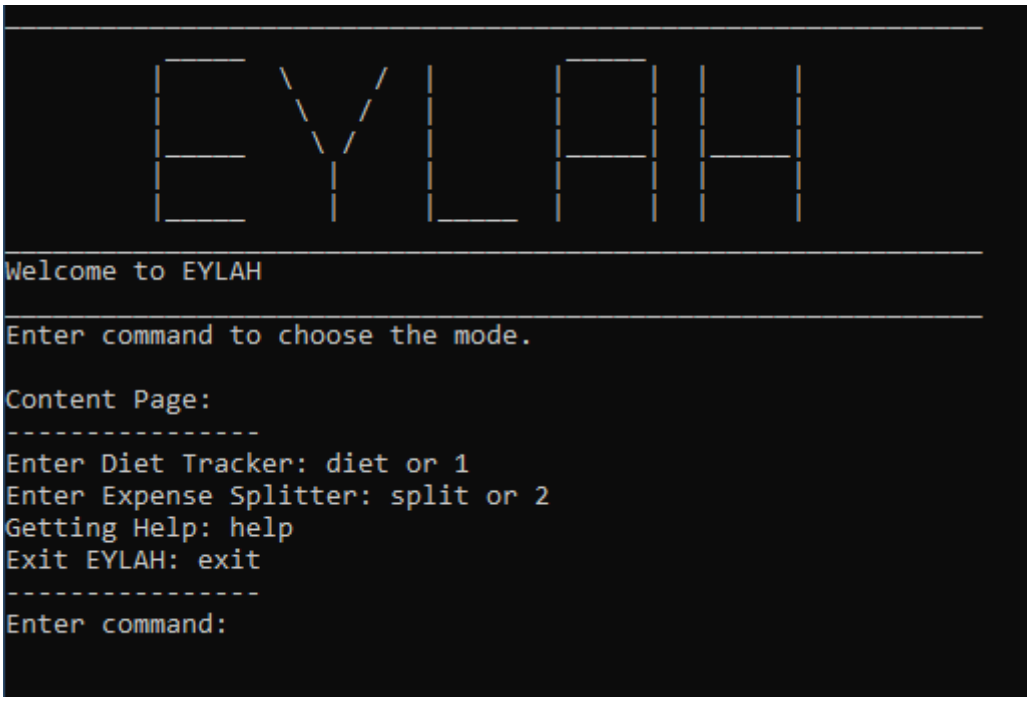
By: AY1920S2-CS2103T-W13-1 Since: Feb 2020 Licence: MIT

1. Introduction

1.1. About EYLAH

Ease Your Lives At Hall (EYLAH) is a Command Line Interface (CLI) application designed to aid students staying in **Temasek Hall within the National University of Singapore** with commonly faced problems such as, **tracking their diet** and **splitting a large bill** with a group of friends.

Shown below is the CLI of EYLAH.



1.2. About this guide

This documentation serves as an introduction to the architecture and implementation of EYLAH, and is made for developers who wish to maintain, modify or understand the software development behind our application. We adopted the top-down approach; we will first look into high-level architectures before exploring implementation details of each feature.

We encourage you to traverse the full path from the high level design to the implementation details of the feature you are interested for the most complete understanding.

1.3. Tips on reading the Developer Guide

While reading the Developer Guide you may encounter some symbols. These symbols are used to highlight crucial information and in this portion we are explaining (or will be explaining) the symbols and their meaning.

NOTE	This block of text with a blue exclamation mark indicates **additional notes** and **information** that the user should consider to prevent unexpected behaviour.
TIP	This block of text with a yellow light bulb indicates **additional tips** that will help the user when using EYLAH.
WARNING	This symbol indicates warnings.

`markup` - A grey highlight (known as a mark-up) indicates keywords, including commands you can type into EYLAH.

2. Setting up

Refer to the guide here.

3. Design

3.1. Architecture

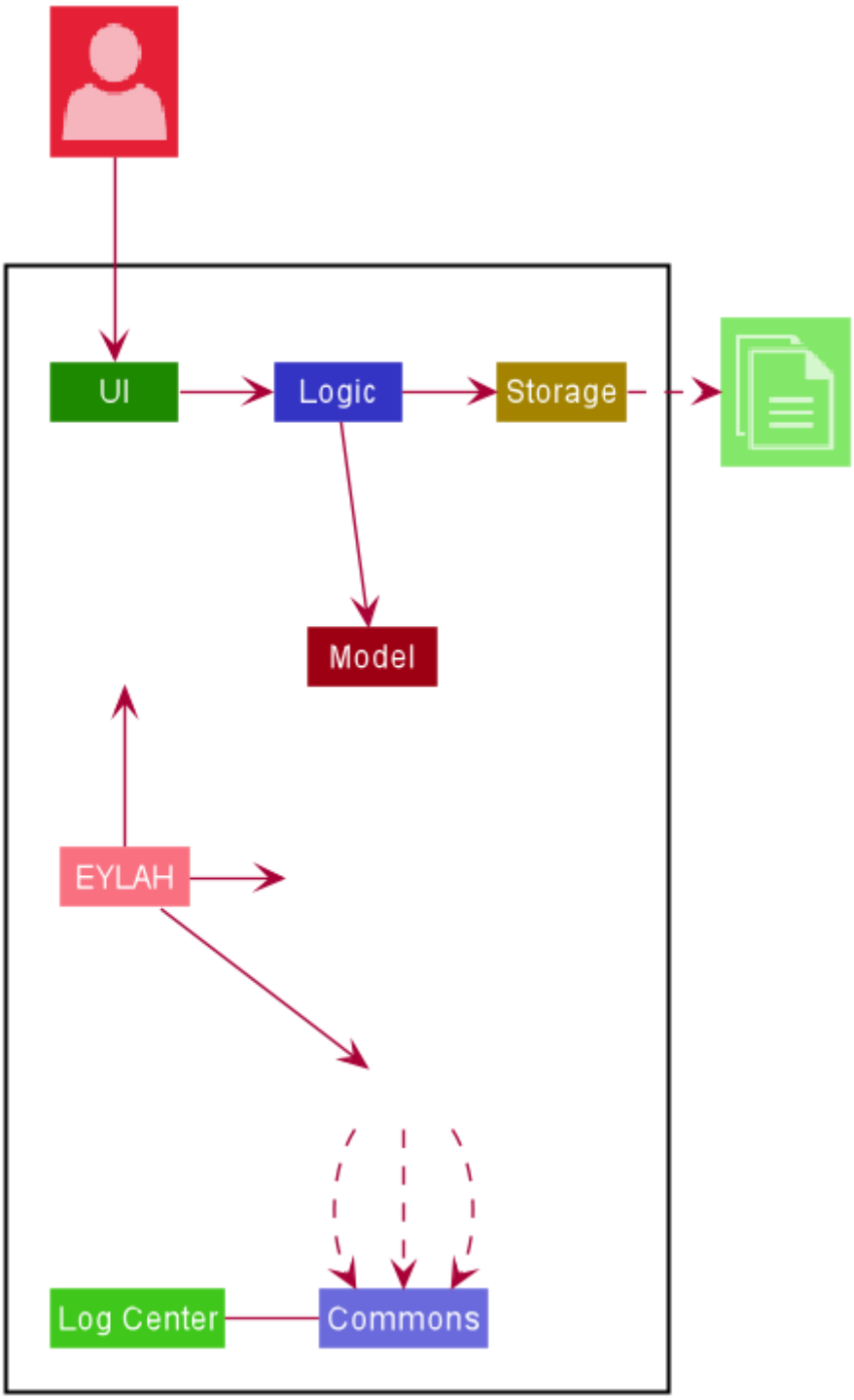


Figure 1. Architecture Diagram

The ***Architecture Diagram*** given above explains the high-level design of the application. Given below is a quick overview of each component.

TIP	The `.puml` files used to create diagrams in this document can be found in the diagrams folder. Refer to the Using PlantUML guide to learn how to create and edit diagrams.

`EYLAH` contains the main class for the application. It is responsible for,

- At app launch: Initializes the components in the correct sequence, and connects them up with each other.

- At shut down: Shuts down the components and invokes cleanup method where necessary.

`Commons` represents a collection of classes used by multiple other components. The following class plays an important role at the architecture level:

- `LogsCenter` : Used by many classes to write log messages to the App's log file.

The rest of the App consists of four components.

- `UI`: The UI of the App.
- `Logic`: The command executor.
- `Model`: Holds the data of the App in-memory.
- `Storage`: Reads data from, and writes data to, the hard disk.

Each of the four components

- Defines its *API* in an `interface` with the same name as the Component.
- Exposes its functionality using a `{Component Name}Manager` class.

For example, the `Logic` component (see the class diagram given below) defines it's API in the `Logic.java` interface and `MODELogic.java` interface and exposes its functionality using the `MODELogicManager.java` class.

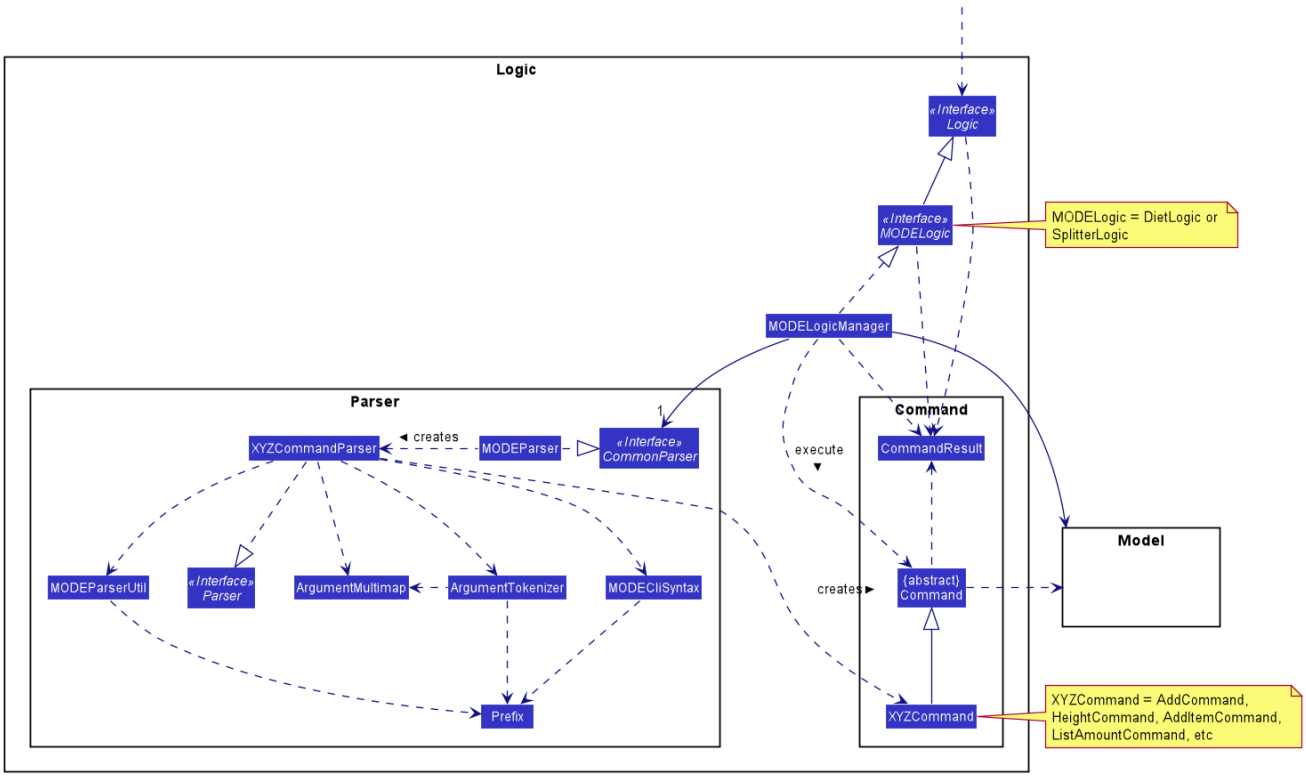


Figure 2. Class Diagram of the Logic Component

How the architecture components interact with each other

The *Sequence Diagram* below shows how the components interact with each other for the scenario where the user issues the command `deleteitem 1`.

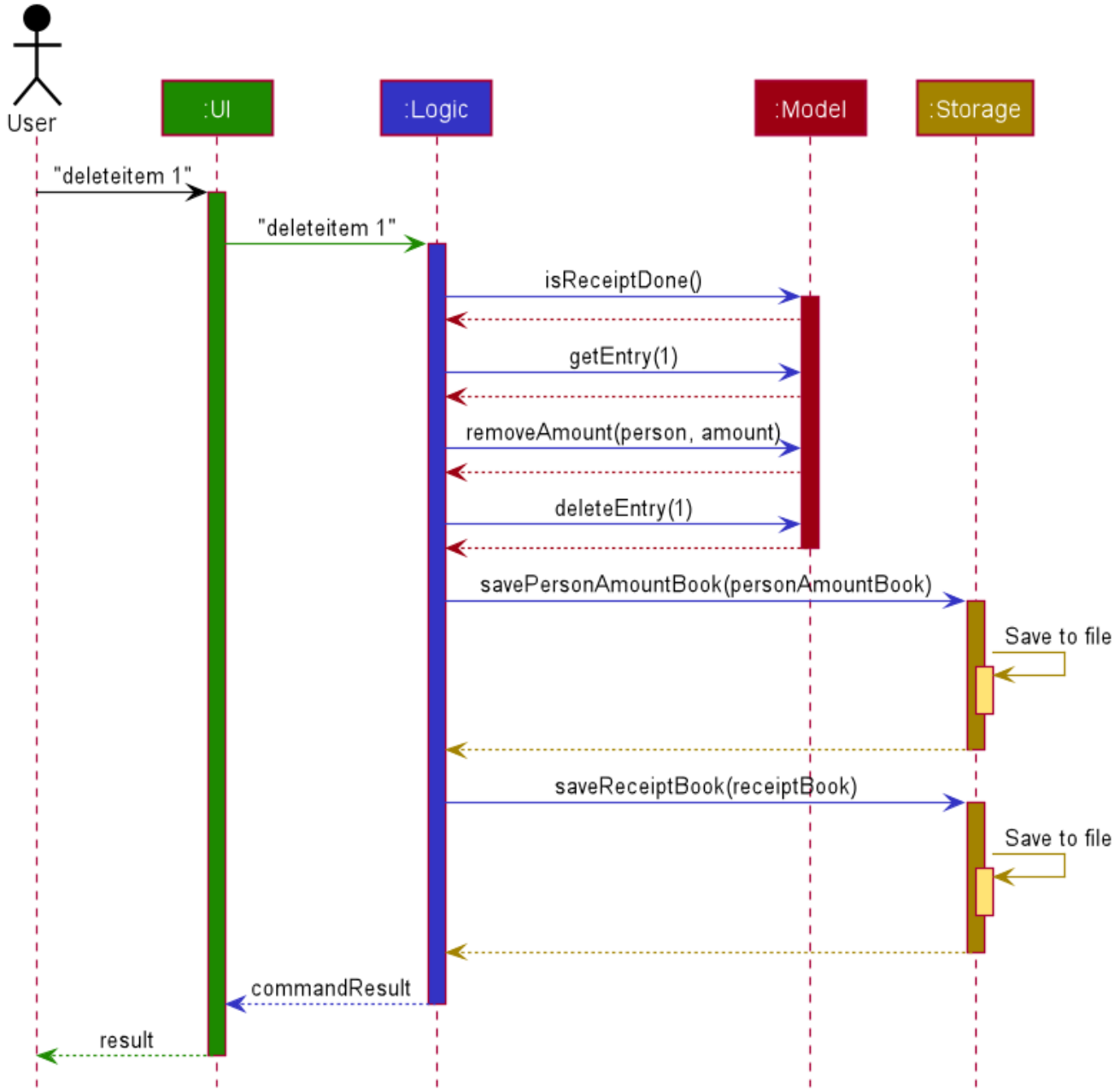


Figure 3. Component interactions for `deleteitem 1` command

3.2. UI component

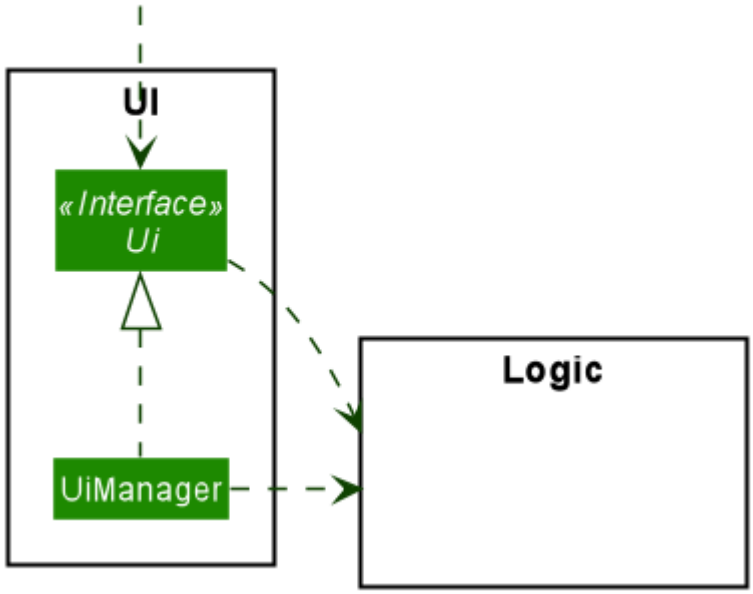


Figure 4. Structure of the UI Component

API : `Ui.java`

Th `UI Component` mainly deals with interactions with the user. It also plays a part in the initialisation of the program printing the logo, welcome message and main menu page to user. This component only has 2 classes, `Ui.java` and `UiManager.java`.

The `UI` component,

- Reading the user input.
- Displaying the result messages to the user.

3.3. Logic component

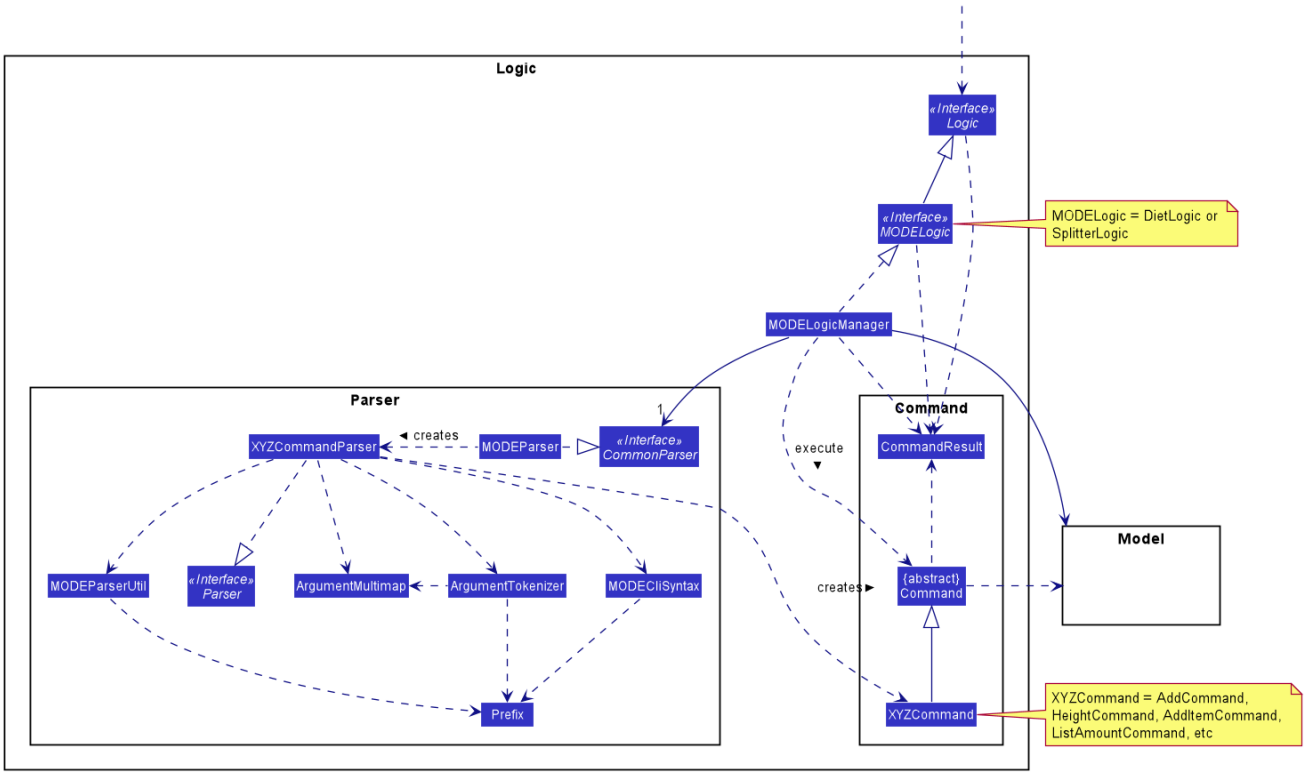


Figure 5. Structure of the Logic Component

API : `Logic.java` `DietLogic.java` `SplitterLogic.java`

The `Logic Component` deals with the logic flows of the App. In each feature mode, the components to deal with the logic flow are different. In `Diet Tracker` mode, `DietLogic.java` and `DietLogicManager.java` are used to handle the logic operation of the APP. In `Expense Splitter` mode, `SplitterLogic.java` and `SplitterLogicManager.java` are used to handle the logic operation.

NOTE

- `MODE` used in the given subsection refers to `Diet` when in `Diet Tracker` mode, `Splitter` when in `Expense Splitter` mode. For example, `MODELogic` given below refers to `SplitterLogic` when in `Expense Splitter` mode.
- `MODEParser` is an exception. When in `Expense Splitter` mode it refers to `ExpenseSplitterParser` while in `Diet Tracker` mode it refers to `FoodBookParser`.

1. `MODELogic` uses the `MODEParser` class to parse the user command.
2. This results in a `Command` object which is executed by the `MODELogicManager`.
3. The command execution can affect the `Model` (e.g. deleting AN entry).
4. The result of the command execution is encapsulated as a `CommandResult` object which is passed back to the `Ui`.
5. In addition, the `CommandResult` object can also instruct the `Eylah.java` application to perform certain actions, such as to go back to main menu or exit the App.

Given below is the Sequence Diagram for interactions within the `Logic Component` for the `execute("deleteitem 1")` API call.

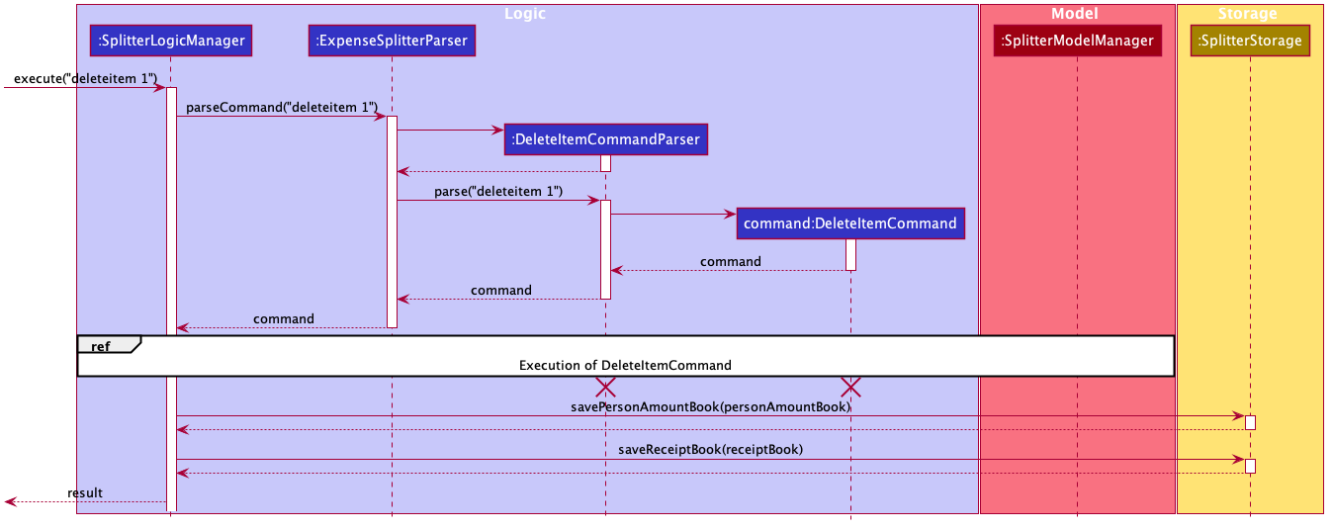


Figure 6. Interactions Inside the Logic Component for the `deleteitem 1` Command in Expense Splitter mode

NOTE	The lifeline for `DeleteItemCommandParser` should end at the destroy marker (X) but due to a limitation of PlantUML, the lifeline reaches the end of diagram.

3.4. Model component

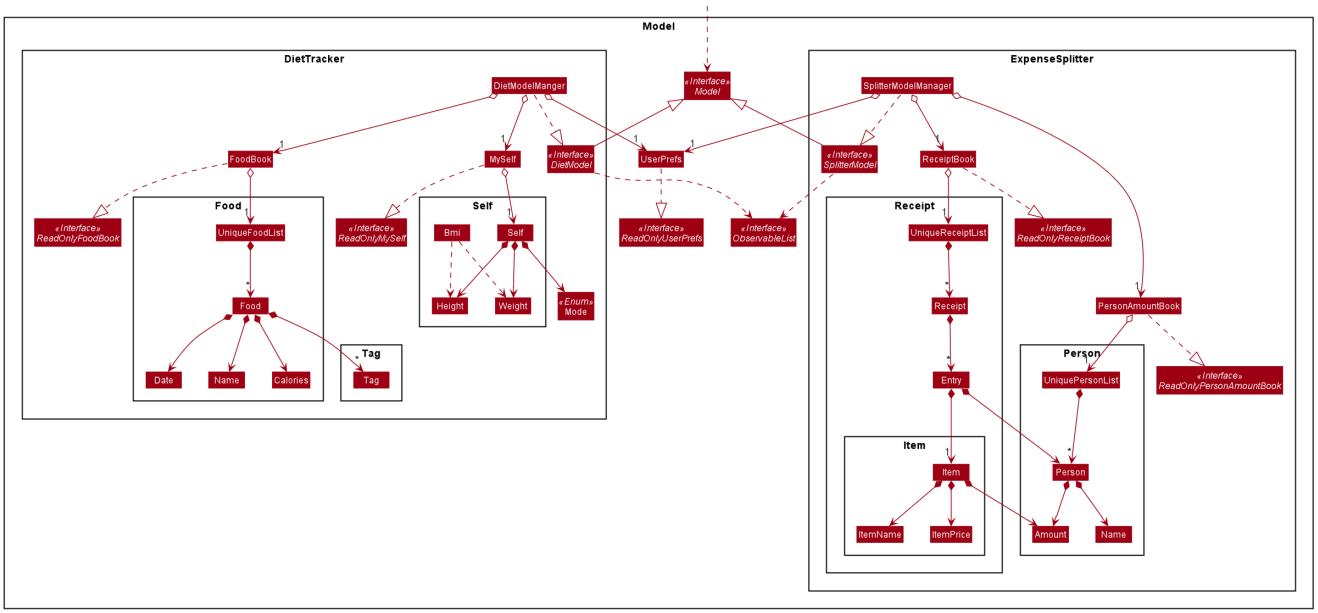


Figure 7. Structure of the Model Component

API : `Model.java` `SplitterModel.java` `DietModel.java`

The `Model Component` deals with the modeling of the object.

NOTE	`MODE` used in the given subsection refers to `Diet` when in `Diet Tracker` mode, `Splitter` when in `Expense Splitter` mode. For example, `MODEModel` given below refers to `SplitterModel` when in `Expense Splitter` mode.

The `MODEModel`,

- stores a `UserPref` object that represents the user's preferences.

- stores the PersonAmountBook and ReceiptBook data in `Expense Splitter` mode.
- stores the FoodBook and Myself data in `Diet Tracker` mode.
- does not depend on any of the other three components.

3.5. Storage component

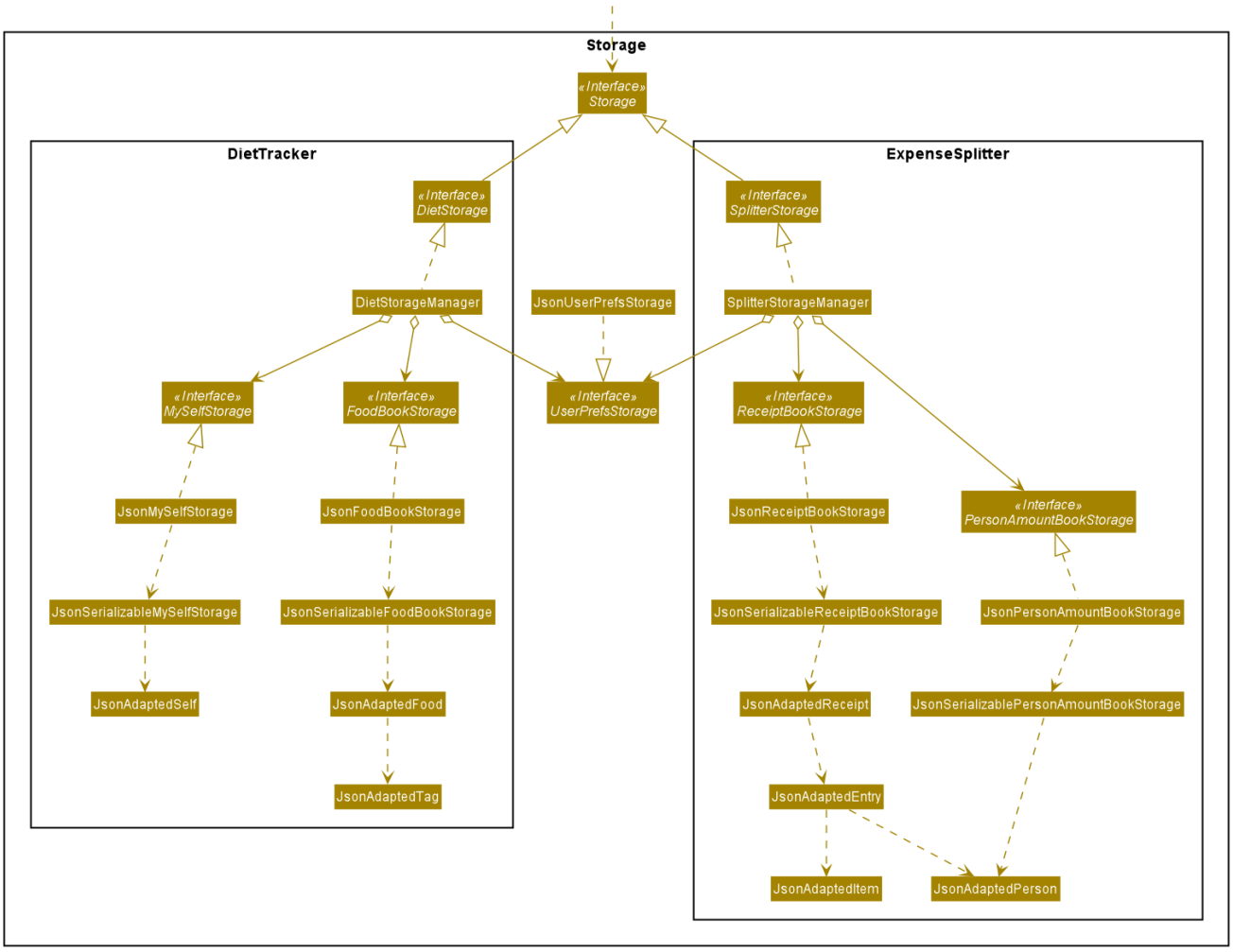


Figure 8. Structure of the Storage Component

API : `Storage.java` `SplitterStorage.java` `DietStorage.java`

The `Storage Component` deals with the operations to write and read from the local files.

NOTE	`MODE` used in the given subsection refers to `Diet` when in `Diet Tracker` mode, `Splitter` when in `Expense Splitter` mode.For example, `MODEStorage` given below refers to `SplitterStorage` when in `Expense Splitter` mode.

The `MODEStorage` component,

- can save `UserPref` objects in json format and read it back.
- can save the PersonAmountBook and ReceiptBook data in json format and read it back in `Expense Splitter` mode.

- can save the FoodBook and MySelf data in json format and read it back in `Diet Tracker` mode.

3.6. Common classes

Classes used by multiple components are in the `seedu.eylah.commons` package.

4. Implementation

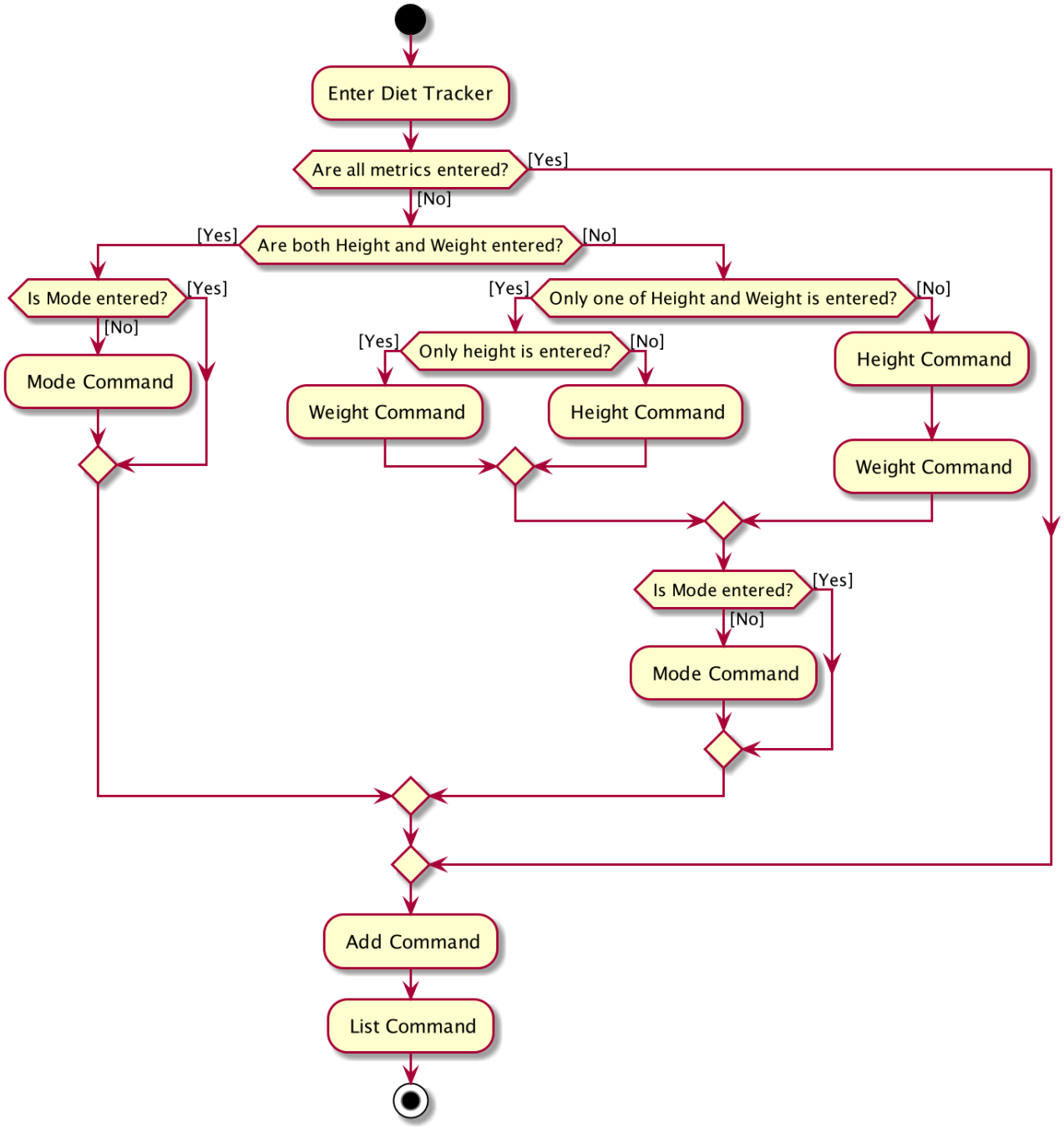
This section describes some noteworthy details on how the features in EYLAH are implemented.

4.1. Diet Tracker feature

The Diet Tracker feature is designed to aid our users in maintaining a healthy lifestyle. The feature comprises of 10 Commands.

- `AddCommand` - Creates a new Food object with its attributes (Name, Calories) and adds it to the FoodBook Storage.
- `DeleteCommand` - Deletes the Food specified by the input index from FoodBook Storage.
- `ListCommand` - Lists the Foods and its attributes (Name, Calories) for the timeframe specified by users based on their user input.
- `EditCommand` - Allows the user to edit an of the Food in Storage.
- `HeightCommand` - Allows users to log their Height in centimeters.
- `WeightCommand` - Allows users to log their Weight in kilograms.
- `BmiCommand` - Calculates the BMI.
- `ModeCommand` - Allows users to toggle between different modes of the diet tracker.
- `MetricsCommand` - Allows users to check their health metrics, like their Height, Weight and Dieting Mode.

Activity Diagram of Diet Tracker:



4.1.1. Add Command

In this section, we will learn more about how the `add` command is implemented.

What is the Add Command

The `add` command allows the user to add a Food into the FoodBook, along with the Name of the Food and the Calories of the Food.

The `add` command was implemented as `AddCommand` in the `diettracker/logic/commands` package.

The `add` command has the following input format:

```
add -n NAME -c CALORIES [-t TAG]…
```

NOTE

- `-n NAME` and `-c CALORIES` are **compulsory** fields.
- There can be multiple `-t TAG`.
- `CALORIES` can range from 0 to 1000000. Calories are implemented as Integers.

The following activity diagram illustrates what happens when a user executes the `add` command:

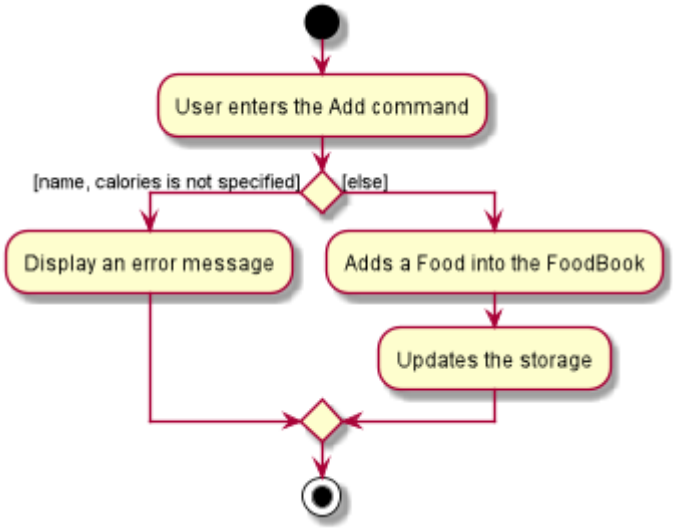


Figure 9. Add Command Activity Diagram

Structure of Add Command

In this section, you will learn more about the relationships between objects related to the `add` command.

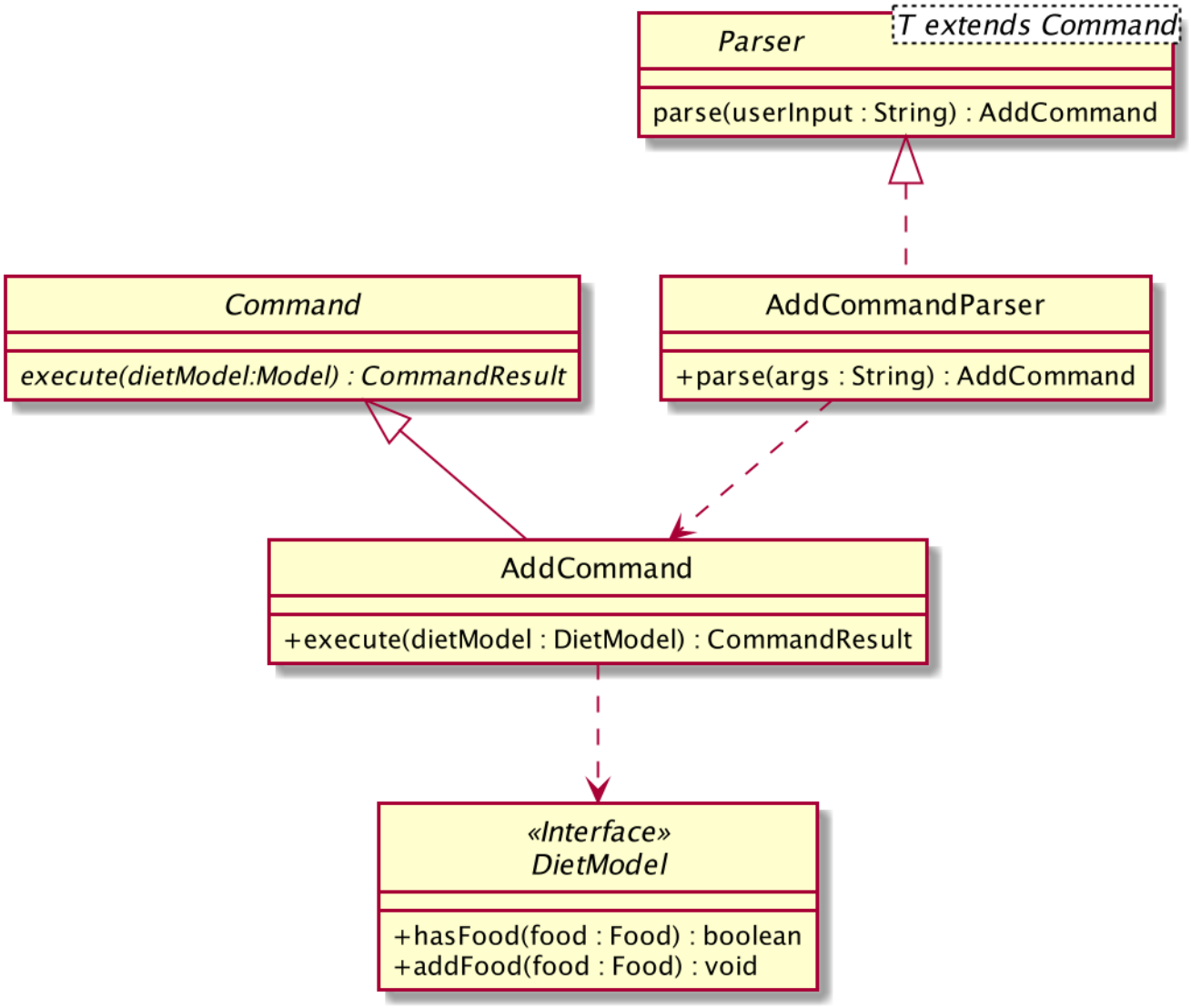


Figure 10. Add Command Class Diagram

The above class diagram shows the structure of the `AddCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `AddCommand`

Implementation of Add Command

The following is a detailed explanation of the operations AddCommand performs.

1. The `AddCommand#execute(Model dietModel)` method is executed and it checks if the specified Name and Calories of a given Food to be added are valid. If valid, a new Food would be created with the specified Name and Calories.
2. The Method `DietModel#addFood(Food food)` would be called to add the food into the `FoodBook#foods`.
3. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.
4. If the command syntax was valid and Food was added to the FoodBook, `LogicManager` calls `FoodBookStorage#saveFoodBook(ReadOnlyFoodBook foodBook)` which saves the new Food Amount into JSON format after serializing it using `JsonAdaptedFood`.

Sequence diagram for Add Command

The following sequence diagram summarizes what happens during the execution of `add` command.

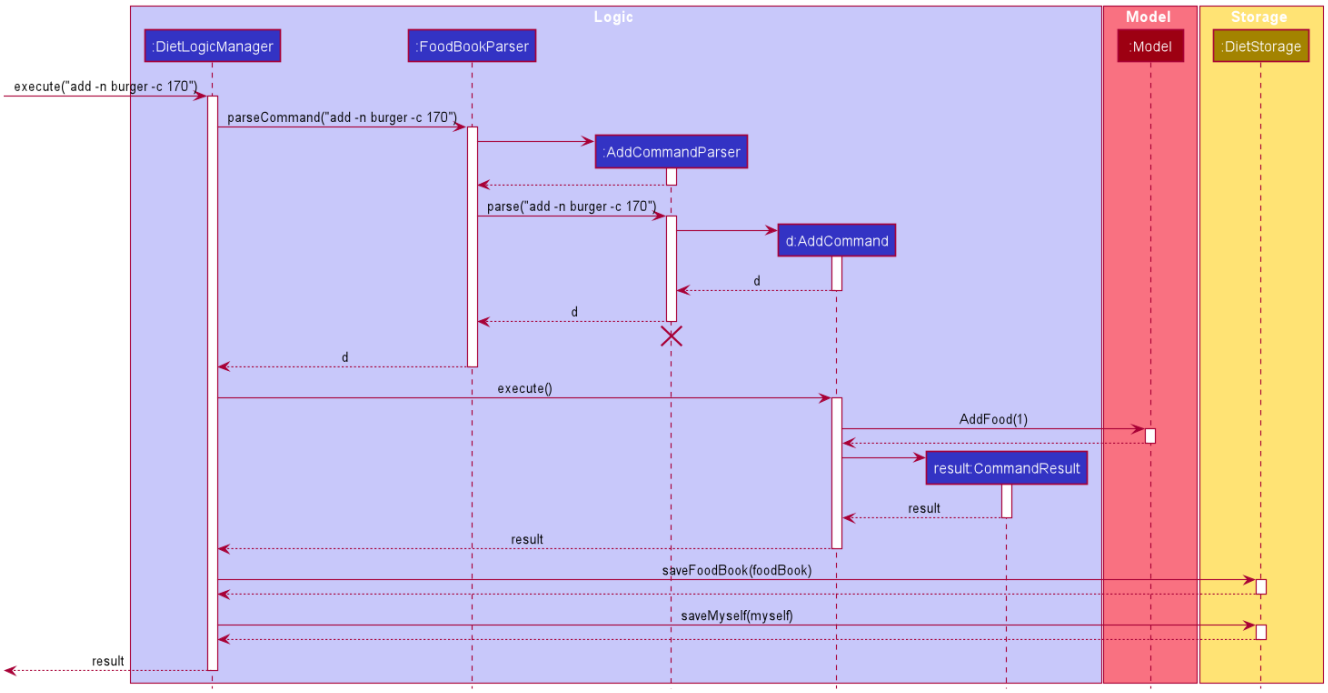


Figure 11. Add Command Sequence Diagram

4.1.2. Delete Command

In this section, we will learn more about how the `delete` command is implemented.

What is the Delete Command

The `delete` command allows users to remove the Food from the FoodBook via the Index.

The `delete` command was implemented as `DeleteCommand` in the `diettracker/logic/commands` package.

The `delete` command has the following input format:

`delete INDEX`

> **NOTE**
>
> - `INDEX` is a compulsory field.
> - The Index of the Food **must** be retrieved by using the `list` command.

The following activity diagram illustrates what happens when a user executes the `delete` command:

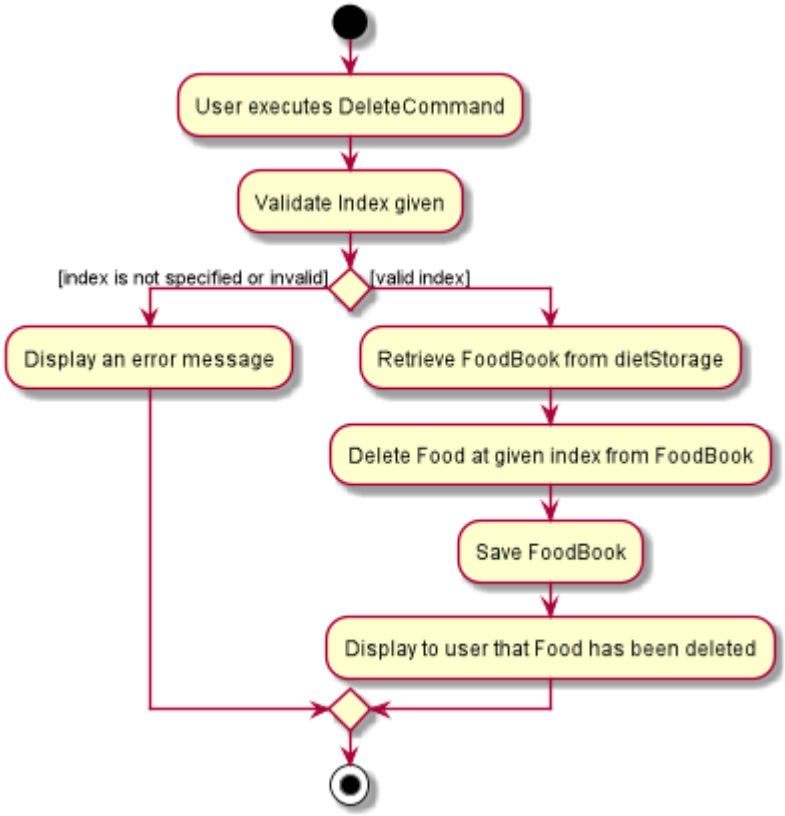


Figure 12. Delete Command Activity Diagram

Structure of Delete Command

In this section, you will learn more about the relationships between objects related to the `delete` command.

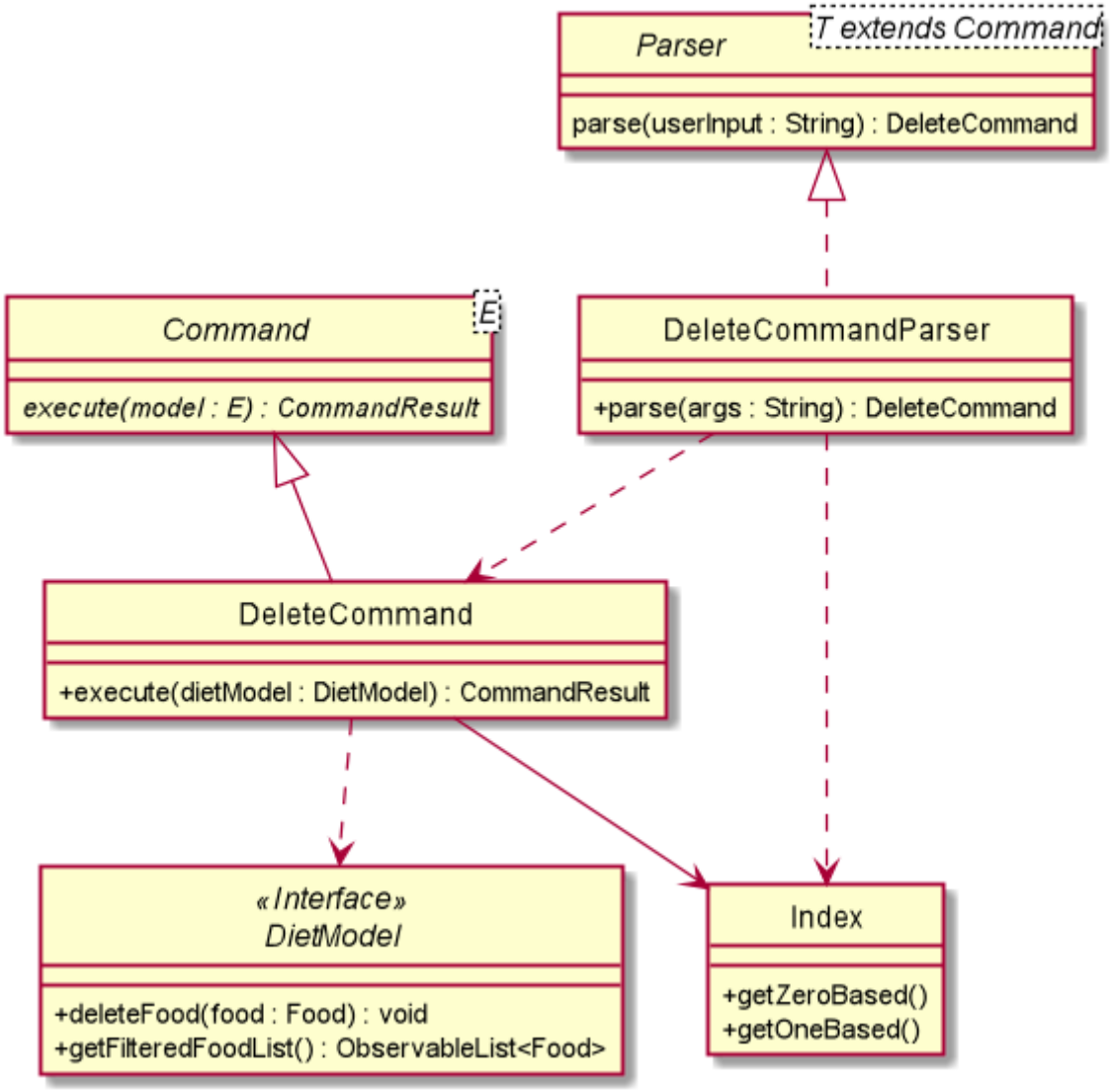


Figure 13. Delete Command Class Diagram

The above class diagram shows the structure of the `DeleteCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `DeleteCommand`

Implementation

The following is a detailed explanation of the operations DeleteCommand performs.

1. The `DeleteCommand#execute(Model dietModel)` method is executed and it validates that the specified Index to delete is within range. If valid, the Food to be deleted will be retrieved from FoodBook using its Index.
2. The method `DietModel#getFilteredFoodList()` will then be called to retrieve the List of Foods from Storage. `List#get(int Index)` is then invoked which retrieves the specified Food to be deleted.
3. The method `DietModel#deleteFood(Food food)` will then be called to remove the Food from the FoodBook. `FoodBook#remove(int Index)` is invoked which makes a call to its internal list to remove the specified Food.
4. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.

5. If the command syntax was valid and Food was removed from FoodBook, `LogicManager` calls `FoodBookStorage#saveFoodBook(ReadOnlyFoodBook foodBook)` which saves the new Foods into JSON format after serializing it using `JsonAdaptedFood`.

Sequence Diagram for Delete Command

The following sequence diagram summarizes what happens during the execution of `delete` command.

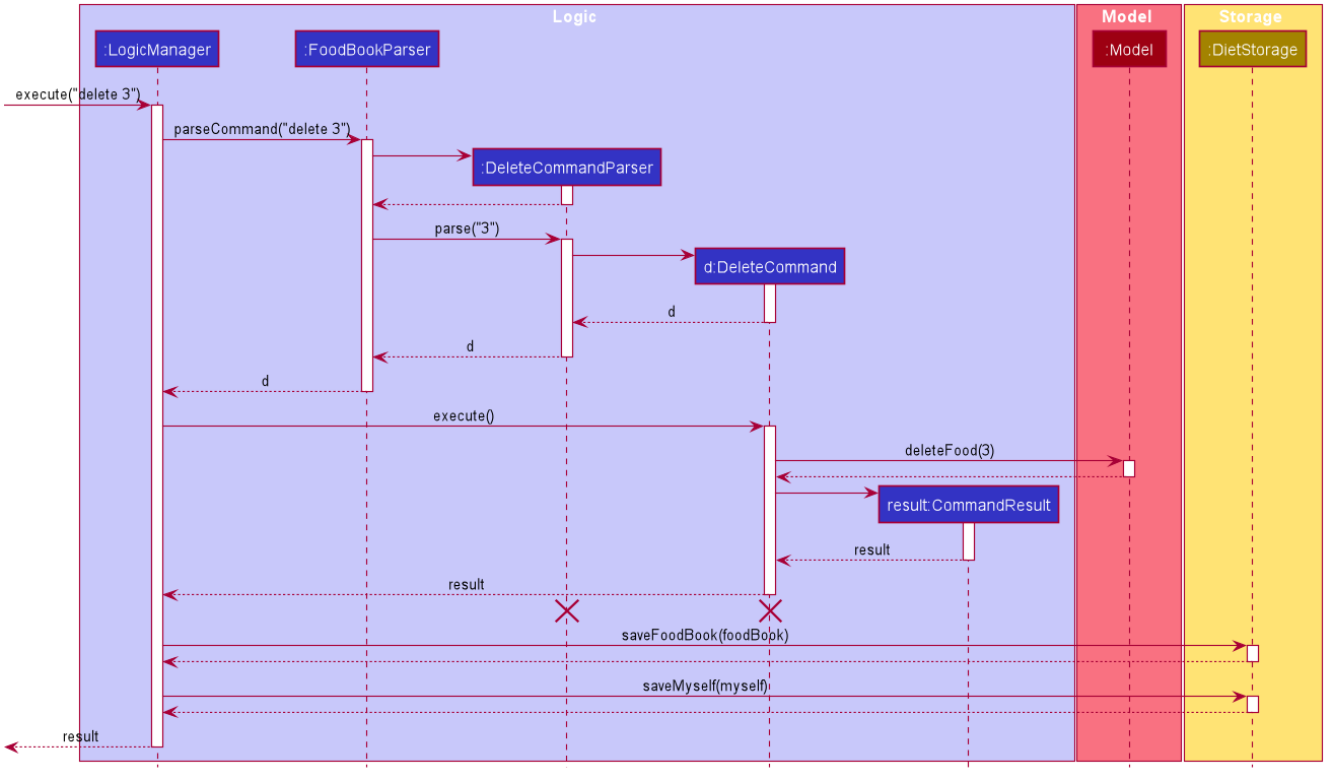


Figure 14. Delete Command Sequence Diagram

4.1.3. List Command

In this section, we will learn more about how the `list` command is implemented.

What is the List Command

The `list` command allows users to find out the current Foods in the FoodBook over a period of time as specified by the flag, or a list of foods with the specified tag.

The `list` command was implemented as a `ListCommand` in the `diettracker/logic/commands` package.

The `list` has the following input format:

```
list [-a] [-d DAYS] [-t TAGS]
```

> **NOTE** Users must only enter **at most ONE** flag when using the list command.

The following activity diagram illustrates what happens when a user executes `list` command:

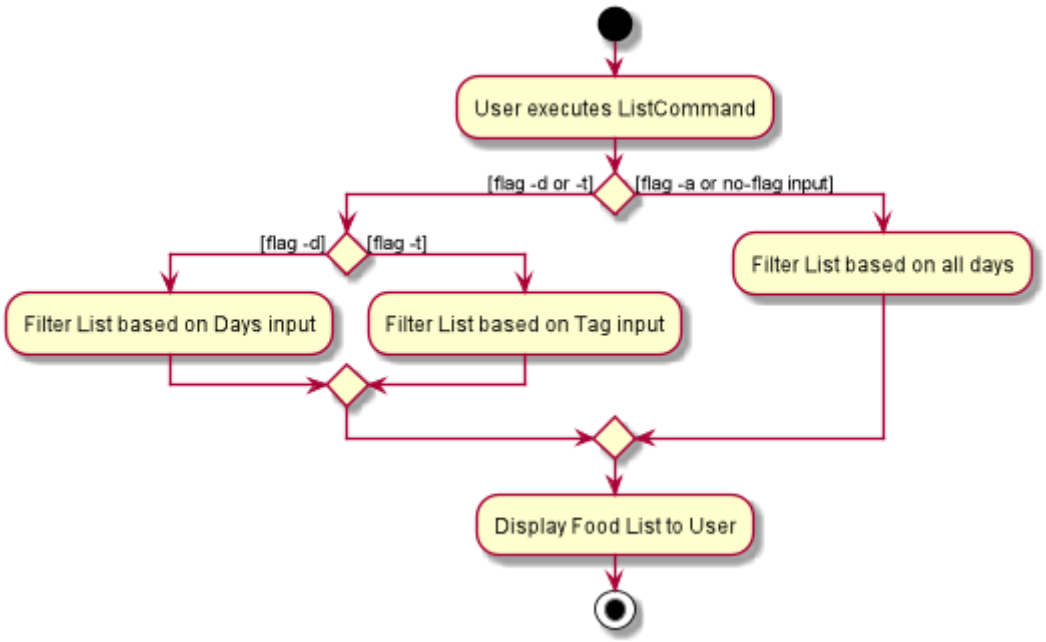


Figure 15. List Command Activity Diagram

Structure of List Command

In this section, you will learn more about the relationships between objects related to the `list` command.

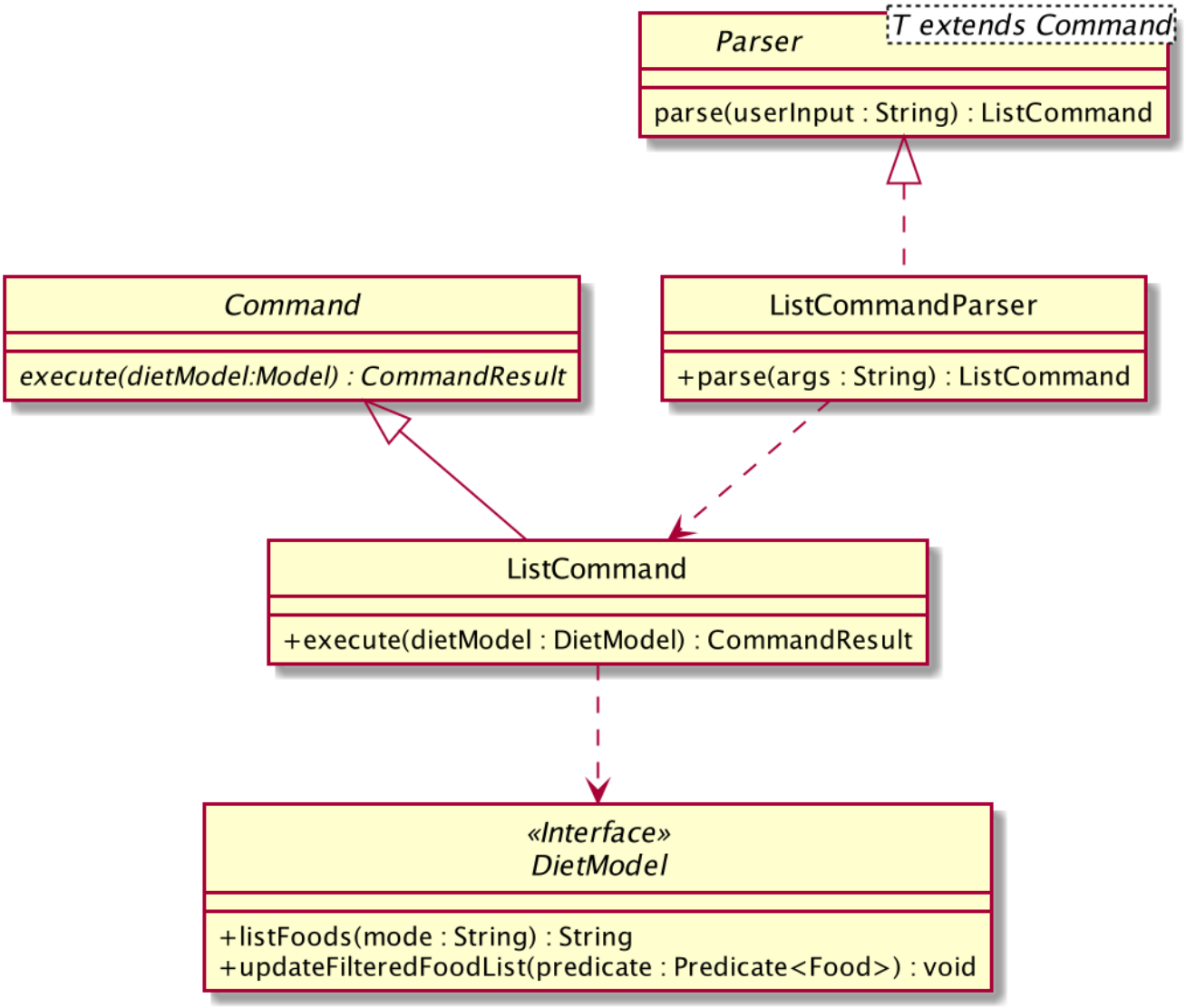


Figure 16. List Command Class Diagram

The above class diagram shows the structure of the `ListCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `ListCommand`

Implementation of List Command

The following is a detailed explanation of the operations `ListCommand` performs.

1. The `ListCommand#execute(DietModel dietModel)` method is executed and it validates that the flag used to decide what Foods to list. If the flag is valid, the items to be listed will be retrieved from FoodBookStorage according to the input flag.
2. The method `DietModel#updateFilteredFoodList() will then be called to retrieve the List of Foods from Storage. `FilteredList#setPredicate(Predicate<Food> predicate)` is then invoked which retrieves the specified Foods to be listed.

```
Case `-a` or No-Flag Input
```

```
Case `-d`
```

```
Case `-t`
```

3. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.

Sequence Diagram for List Command

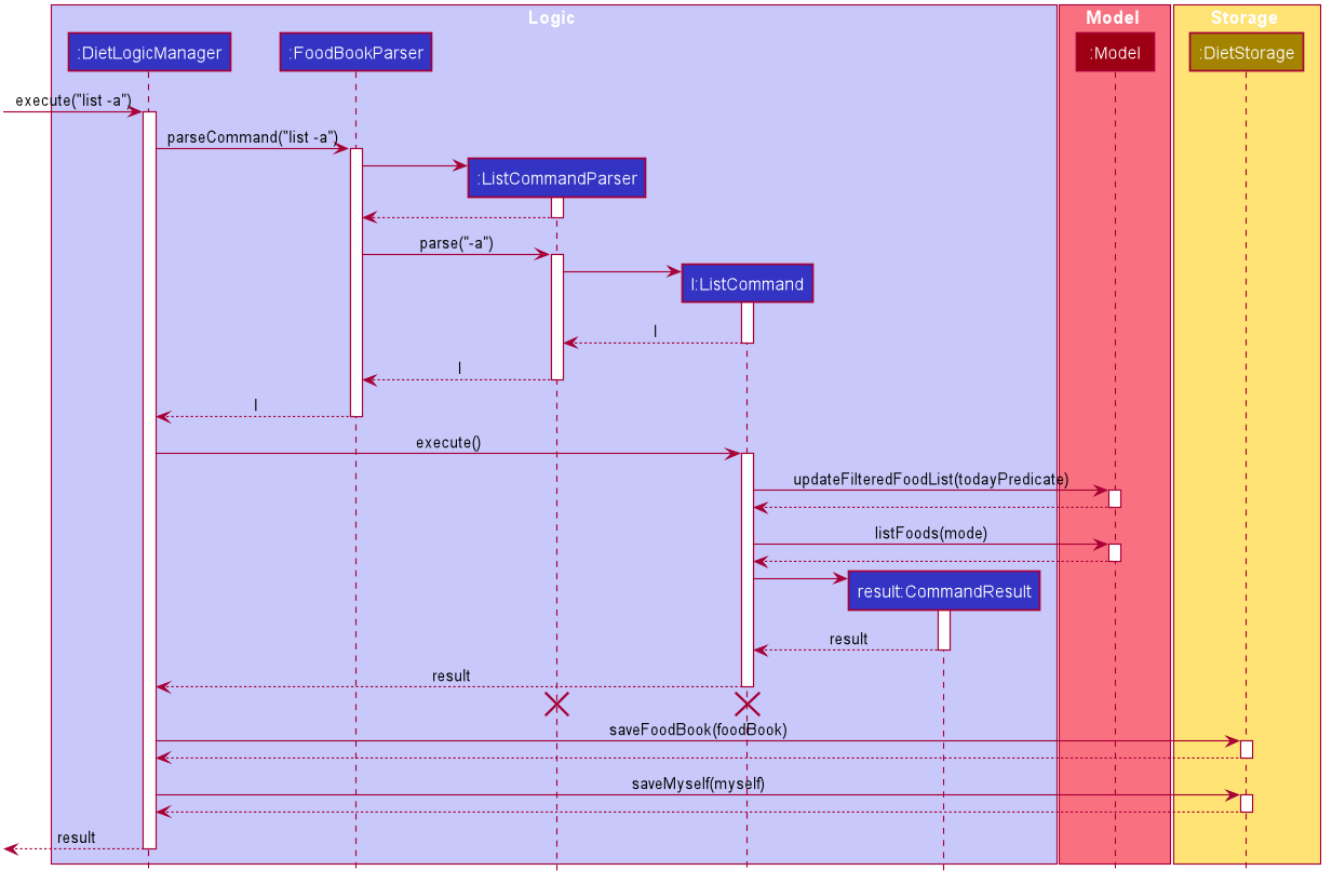


Figure 17. List Sequence Diagram for `-a` or No-Flag Input

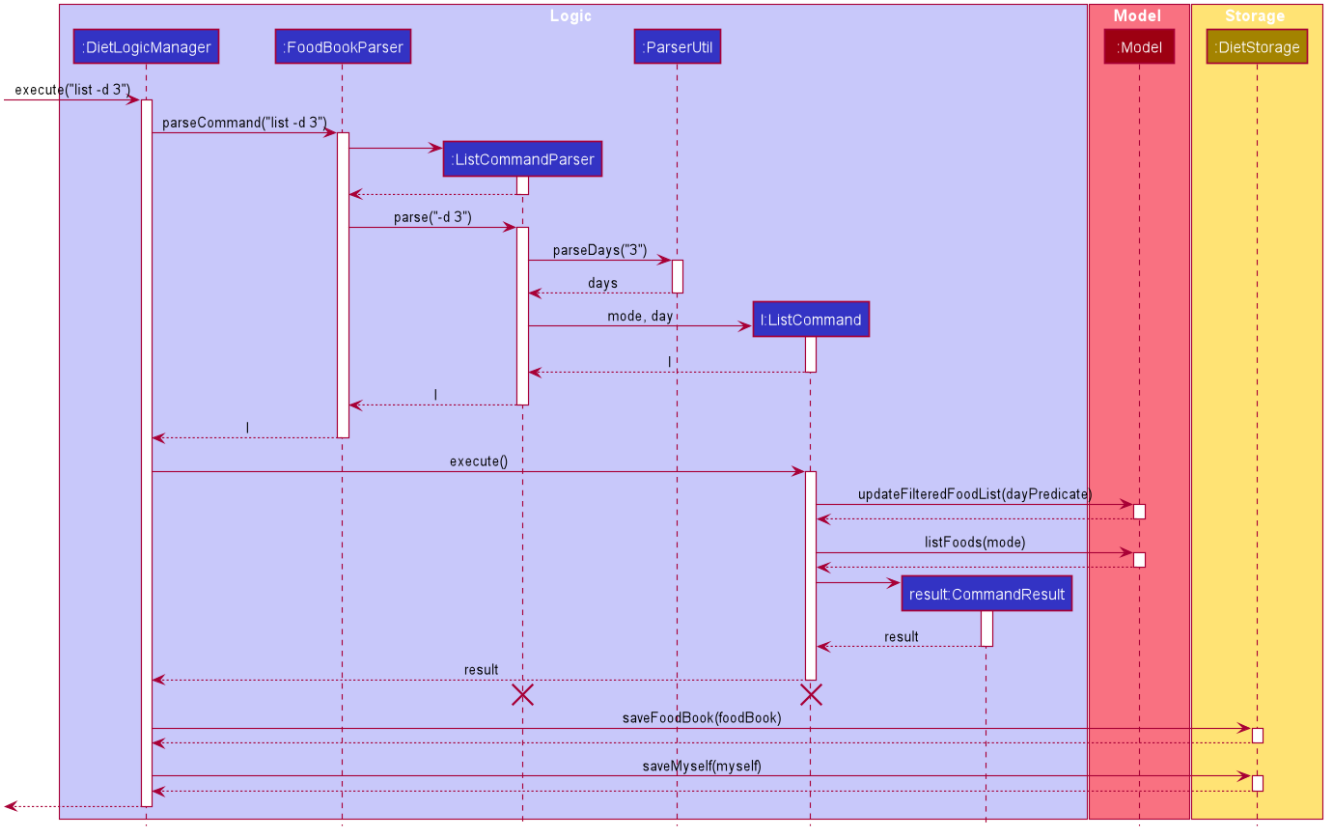


Figure 18. List Sequence Diagram for `-d`

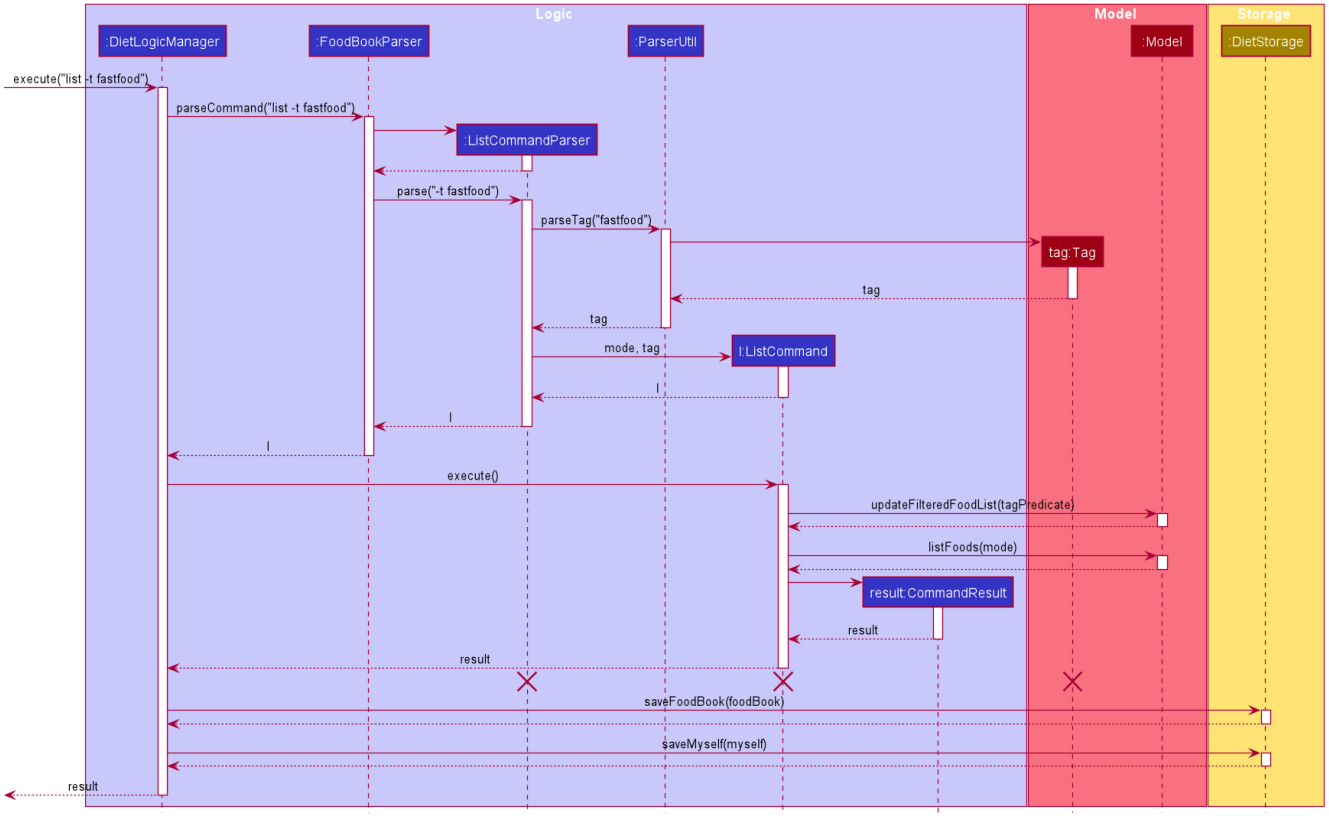


Figure 19. List Sequence Diagram for `-t`

4.1.4. Edit Command

In this section, we will learn more about how the `edit` command is implemented.

What is the Edit Command

The `edit` command allows users to edit the Name of the Food or the Calories of the Food from the FoodBook via the Index.

The `edit` command was implemented as `EditCommand` in the `diettracker/logic/commands` package.

The `edit` command has the following input format:

```
edit -i INDEX [-n NAME] [-c CALORIES]
```

NOTE

- `INDEX` is a compulsory field.
- The Index of the Food to be edited **MUST** be retrieved by using the `list` command.
- At least one of `NAME` or `CALORIES` must be included in the command input.

The following activity diagram illustrates what happens when a user executes the `edit` command:

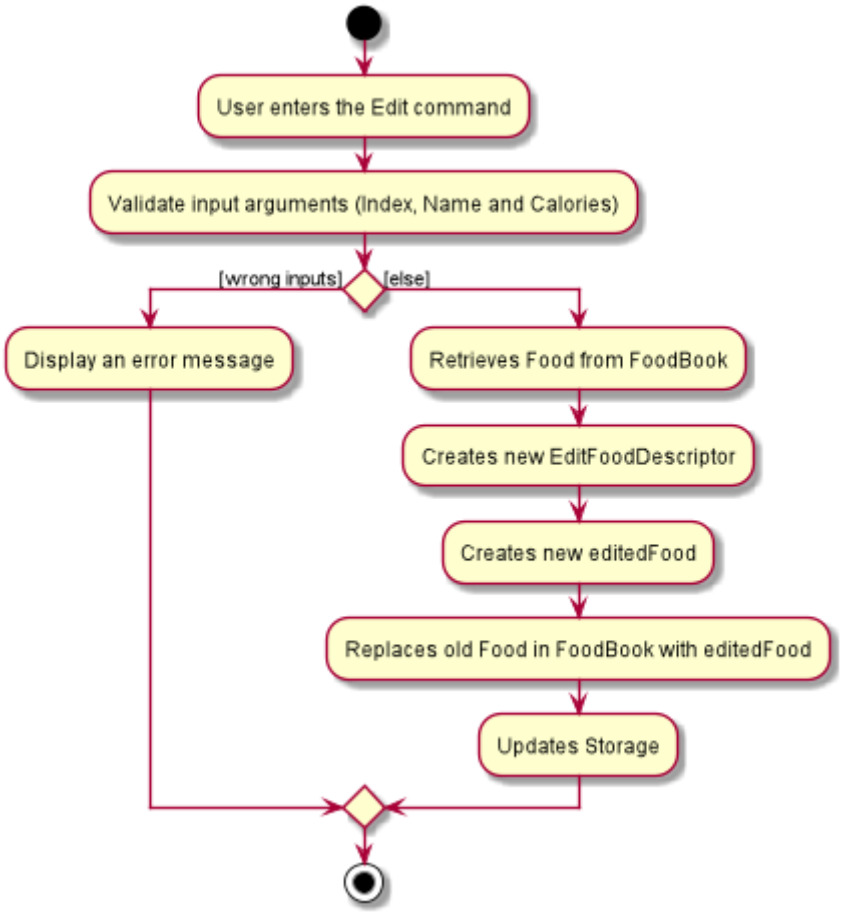


Figure 20. Edit Command Activity Diagram

Structure of Edit Command

In this section, you will learn more about the relationships between objects related to the `edit` command.

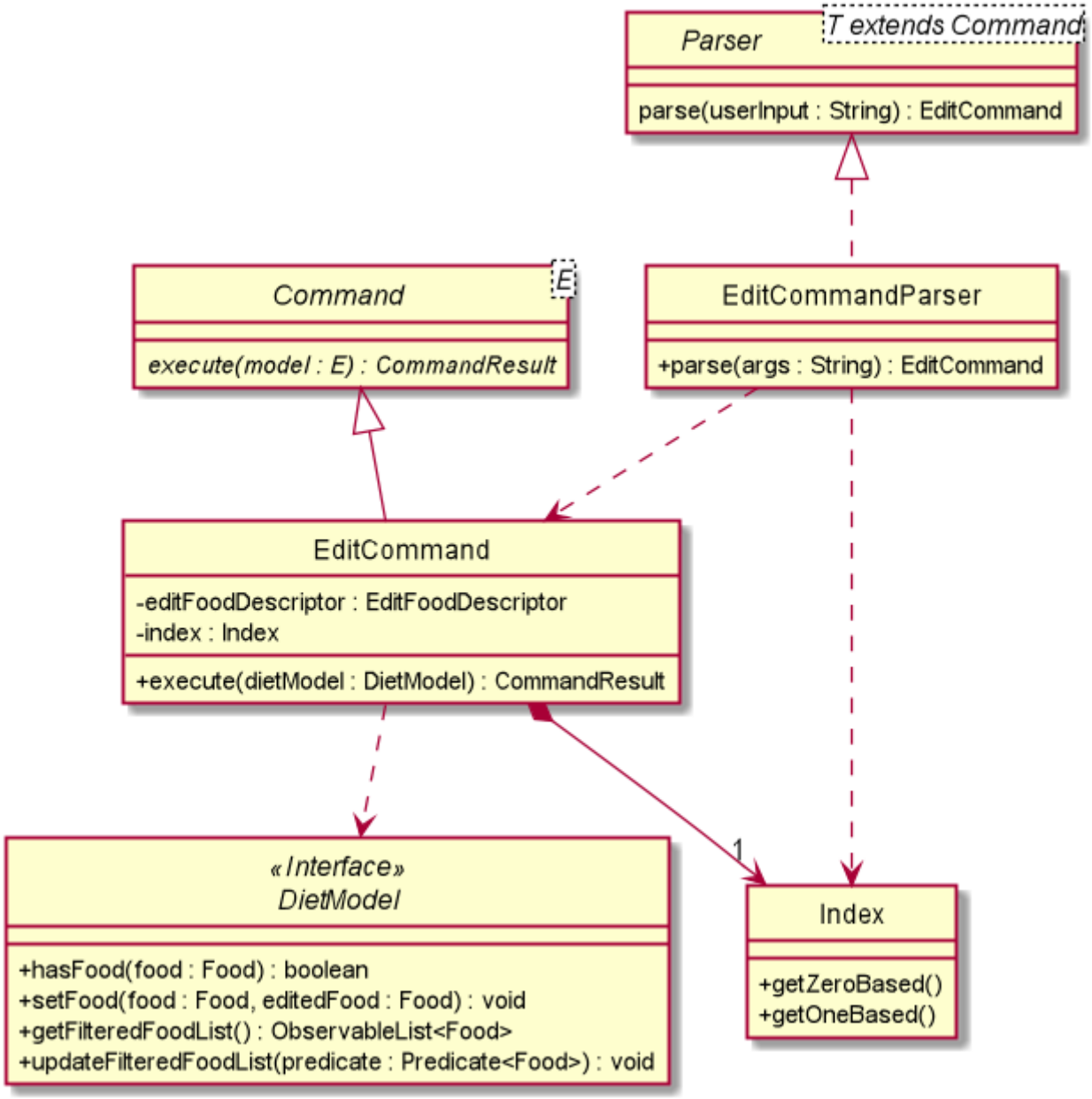


Figure 21. Edit Command Class Diagram

The above class diagram shows the structure of the `EditCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `EditCommand`

Implementation

The following is a detailed explanation of the operations `EditCommand` performs.

1. The `EditCommand#execute(DietModel dietModel)` method is executed and it validates that the specified `INDEX` to edit is within range. If valid, the item to be edited will be retrieved from Storage using its `Index`.
2. The method `DietModel#getFilteredFoodList() will then be called to retrieve the List of Foods from Storage. `List#get(int Index)` is then invoked which retrieves the specified Food to be edited.
3. The method `DietModel#setFood(Food toBeEdited, Food editedFood)` will then be called to replace the Food toBeEdited with the Food editedFood in the List of Foods.

4. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.
5. If the command syntax was valid and Food was edited in FoodBook, `LogicManager` calls `FoodBookStorage#saveFoodBook(ReadOnlyFoodBook foodBook)` which saves the new Foods into JSON format after serializing it using `JsonAdaptedFood`.

Sequence Diagram for Edit Command

The following sequence diagram summarizes what happens during the execution of `edit` command.

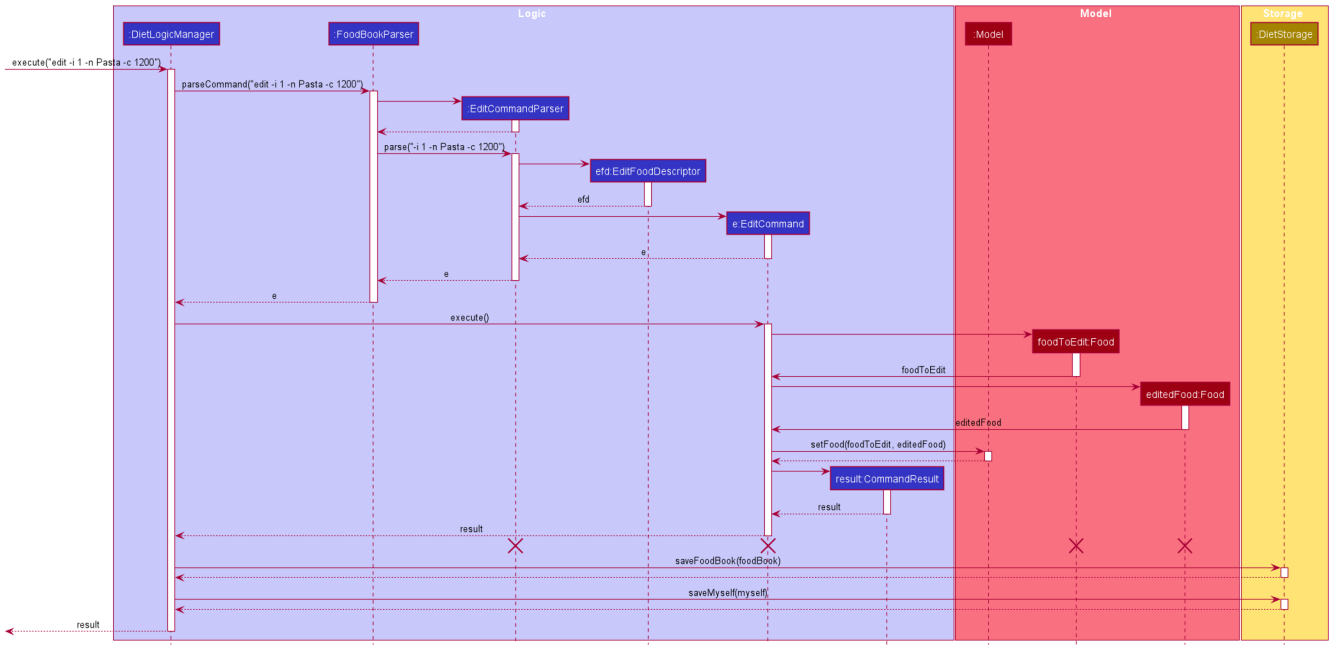


Figure 22. Edit Command Sequence Diagram

4.1.5. Bmi Command

In this section, we will learn more about how the `bmi` command is implemented.

What is the Bmi Command

The `bmi` command allows the user to calculate their Body Mass Index (BMI).

The `bmi` command was implemented as `BmiCommand` in the `diettracker/logic/commands` package.

The `bmi` command has the following input format:

`bmi [-h HEIGHT] [-w WEIGHT]`

NOTE

- `[-h HEIGHT]` and `[-w WEIGHT]` may be omitted if the user has already stored their Height and Weight.
- If Users have one of Height or Weight stored, they may use just the missing metric to calculate their BMI.
- `HEIGHT` and `WEIGHT` can range from >0 to ⇐1000.

The following activity diagram illustrates what happens when a user executes the `bmi` command:

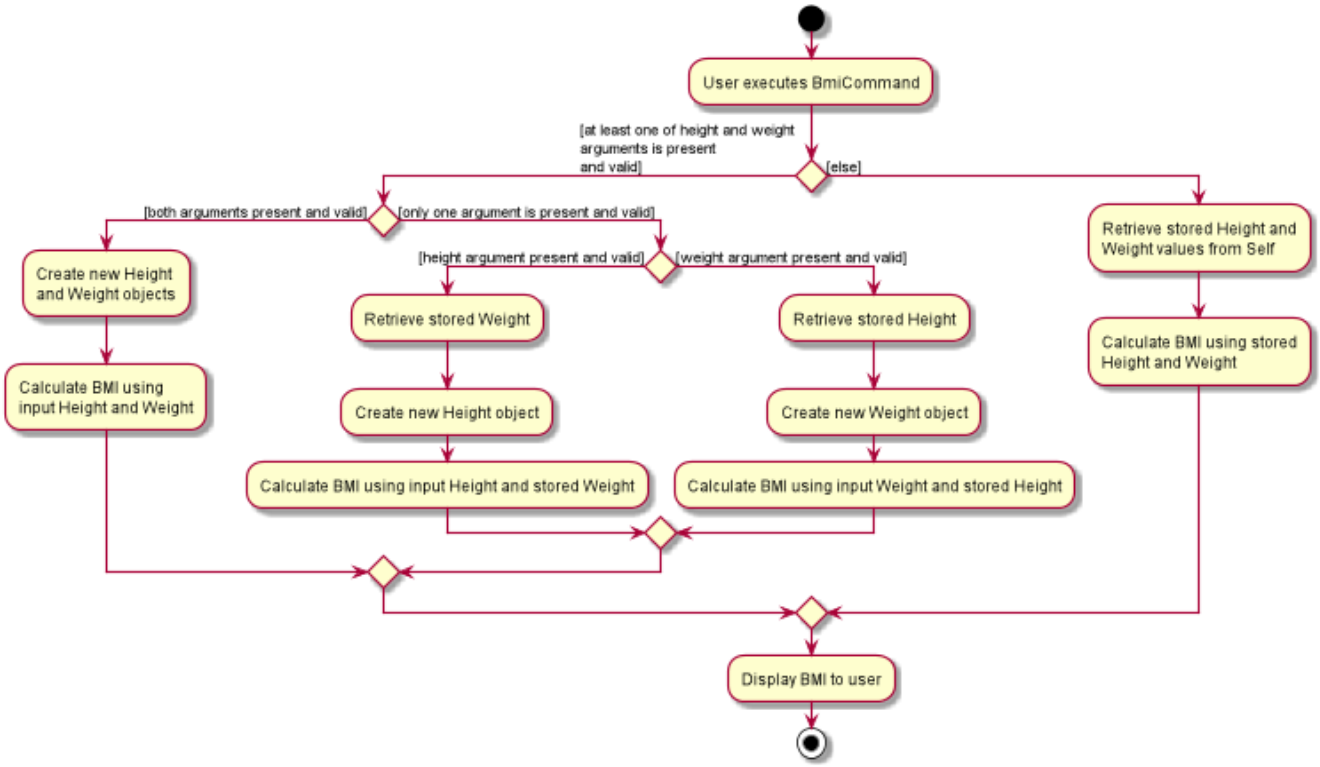


Figure 23. Bmi Command Activity Diagram

Structure of Bmi Command

In this section, you will learn more about the relationships between objects related to the `bmi` command.

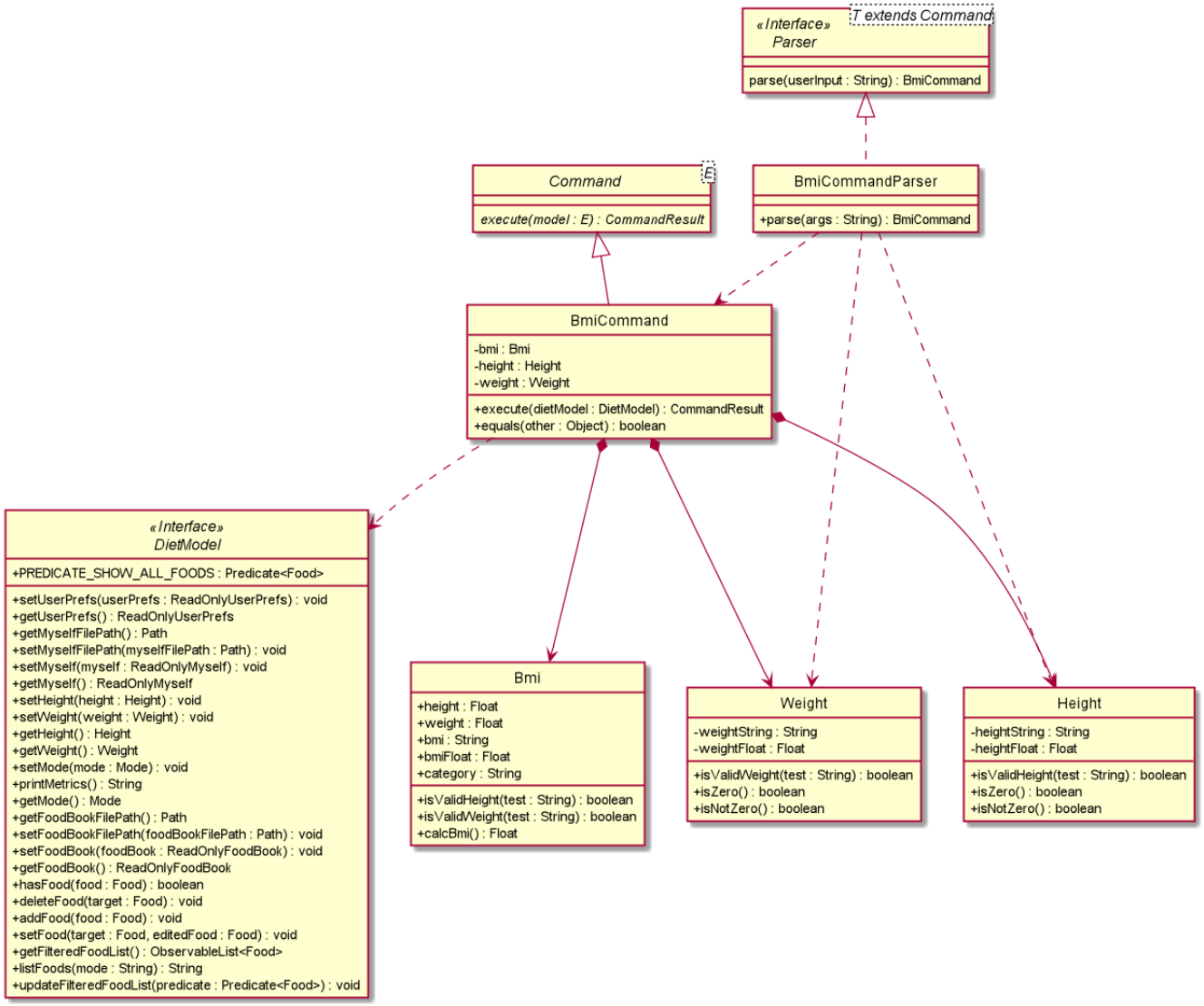


Figure 24. Bmi Command Class Diagram

The above class diagram shows the structure of the `BmiCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `BmiCommand`

Implementation of Bmi Command

The following is a detailed explanation of the operations `BmiCommand` performs. `BmiCommand` has two different usages depending on the user input.

1. The `BmiCommand#execute(Model dietModel)` method is executed and it will return the output of the calculated BMI based on user arguments.
2. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.

Sequence diagram for Bmi Command

Given below are 2 example usages of `BmiCommand` based on different user input.

Usage 1: No Height and Weight input

1. User launches application and enters `Diet` mode. The user then enters `bmi` as the command.
2. The FoodBook parser validates this command and sets up the `BmiCommandParser`, which checks for the input.
3. Since there are no arguments, the `BmiCommandParser` will call the empty constructor `BmiCommand()`.
4. `BmiCommand` would then refer to the internal state of the splitterModel under Self, and retrieve the values stored in Self's Height and Weight attributes.
5. `BmiCommand()` will then proceed to calculate the BMI based on the current values of height and weight.

The following is a sample sequence diagram of the `BmiCommand` with no additional user input.

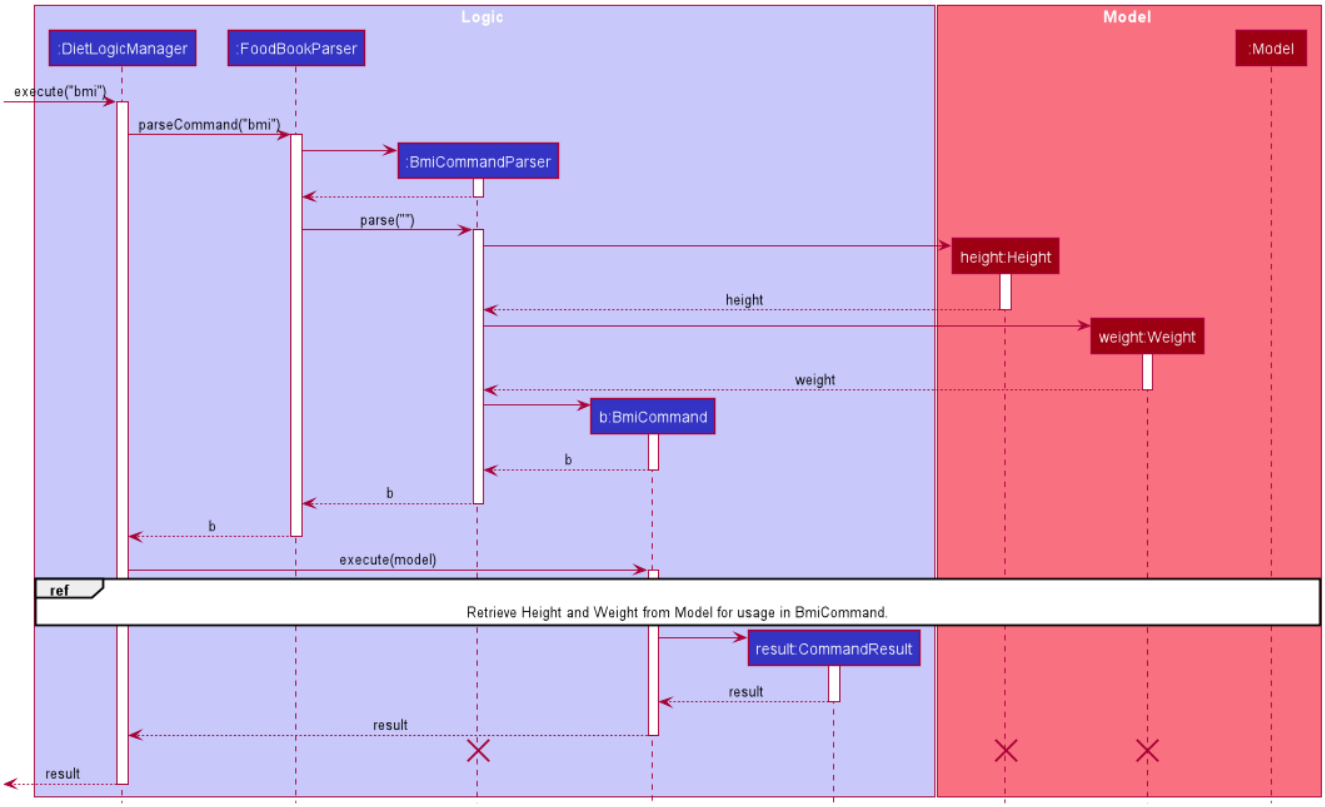


Figure 25. Sequence Diagram Bmi Command Sequence Diagram without Input Arguments

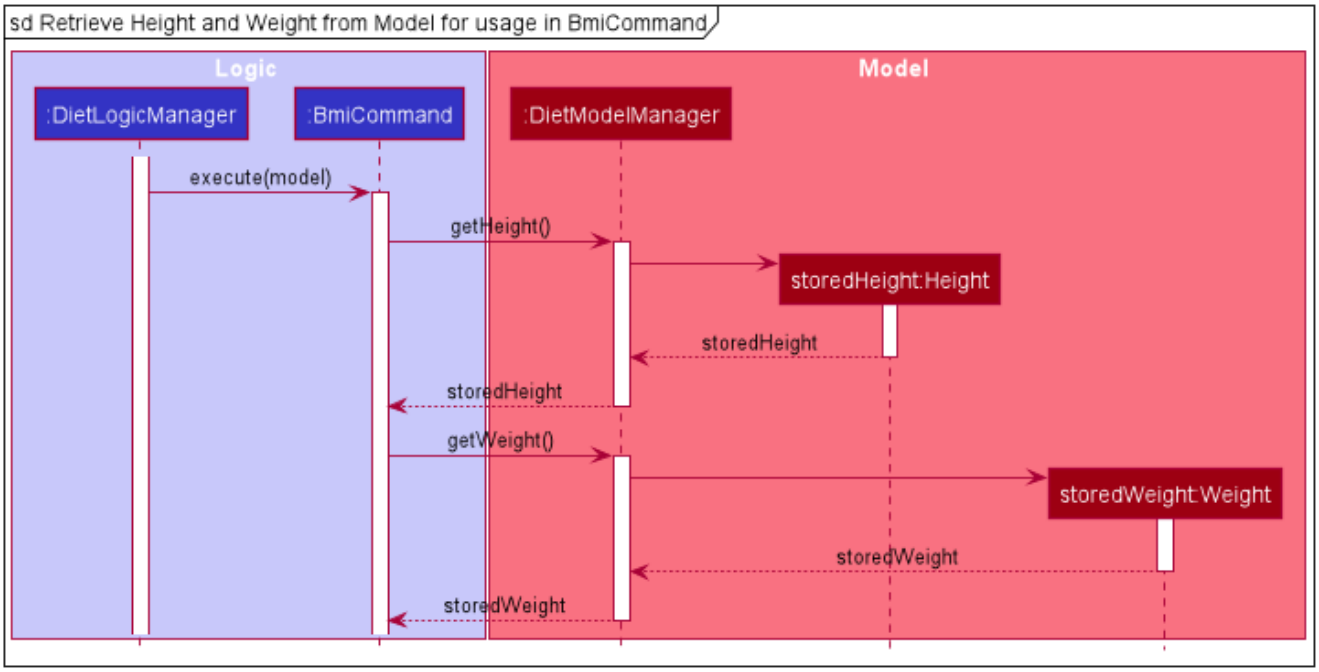


Figure 26. Sequence Diagram: Retrieval of stored Height and Weight from Model

NOTE	There is a need to ensure that there are stored values in `Height` and `Weight` attributes in the `Self` class.

Usage 2: With Height and Weight input

1. User launches application and enters `Diet` mode. The user then enters `bmi` as the command.
2. The FoodBook parser validates this command and sets up the `BmiCommandParser`, which checks for the input.
3. Since there are no arguments, the `BmiCommandParser` will call the empty constructor `BmiCommand()`.
4. `BmiCommand` would then refer to the internal state of the splitterModel under Self, and retrieve the values stored in Self's Height and Weight attributes.
5. `BmiCommand()` will then proceed to calculate the BMI based on the current values of height and weight.

The following is a sample sequence diagram of the `BmiCommand` with additional user input.

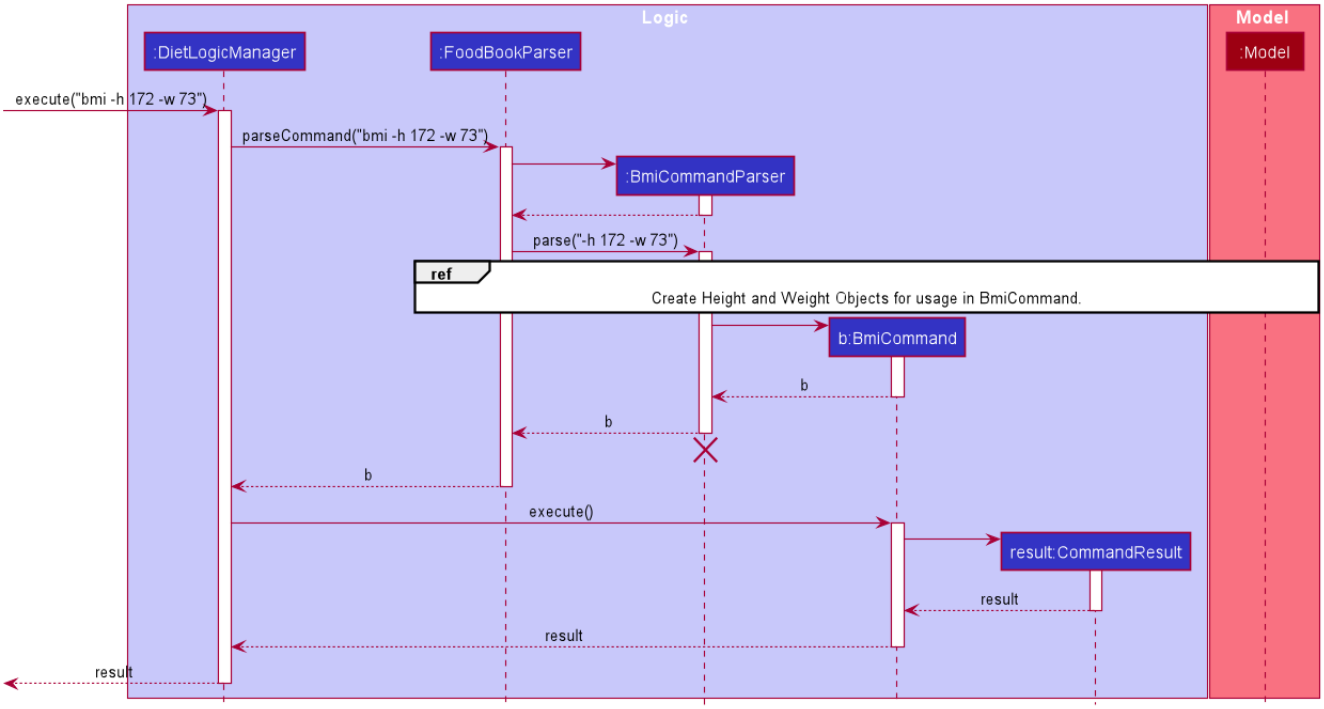


Figure 27. Bmi Command Sequence Diagram with Input Arguments

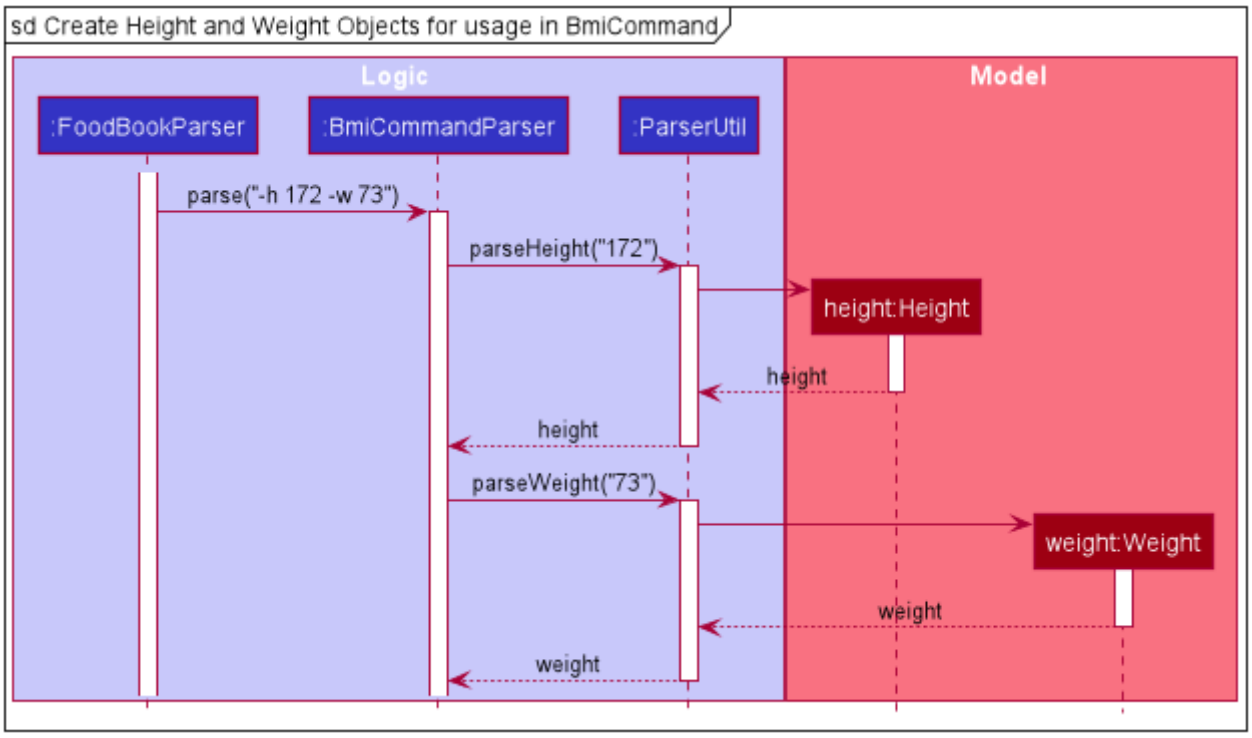


Figure 28. Creation of Height and Weight Objects for usage in Bmi Command

Design Considerations

Aspect: How `BmiCommand` executes

- Alternative 1 (current choice): Executes with other without arguments
  - Pros: More flexible use of the Command, better user experience overall.
  - Cons: Harder to implement, as there needs to be multiple BmiCommand constructors.
- Alternative 2: Executes separately with arguments input and without arguments input

    - Pros: Easier to implement, less potential bugs as Command uses a single constructor.
    - Cons: We must ensure that the implementation of each individual command are correct.

Aspect: Storage of BMI

- Alternative 1 (current choice): No splitterStorage of BMI value, simply prints when user requests.
    - Pros: Less memory used; reduces complexity of the Command and objects involved.
    - Cons: Users may want to access it elsewhere from Self.
- Alternative 2: Storage of BMI value in Self class in Model.
    - Pros: Users have access to it anytime.
    - Cons: Coding complexity.

4.1.6. Height Command

In this section, we will learn more about how the `height` command is implemented.

What is the Height Command

The `height` command allows the user to store their Height into the Diet Tracker.

The `height` command was implemented as `HeightCommand` in the `diettracker/logic/commands` package.

The `height` command has the following input format:

`height HEIGHT`

> **NOTE**
>
> - `HEIGHT` is a **compulsory** field.
> - `HEIGHT` can range from >0 to <1000. `HEIGHT` can be input as a decimal.

The following activity diagram illustrates what happens when a user executes the `height` command:

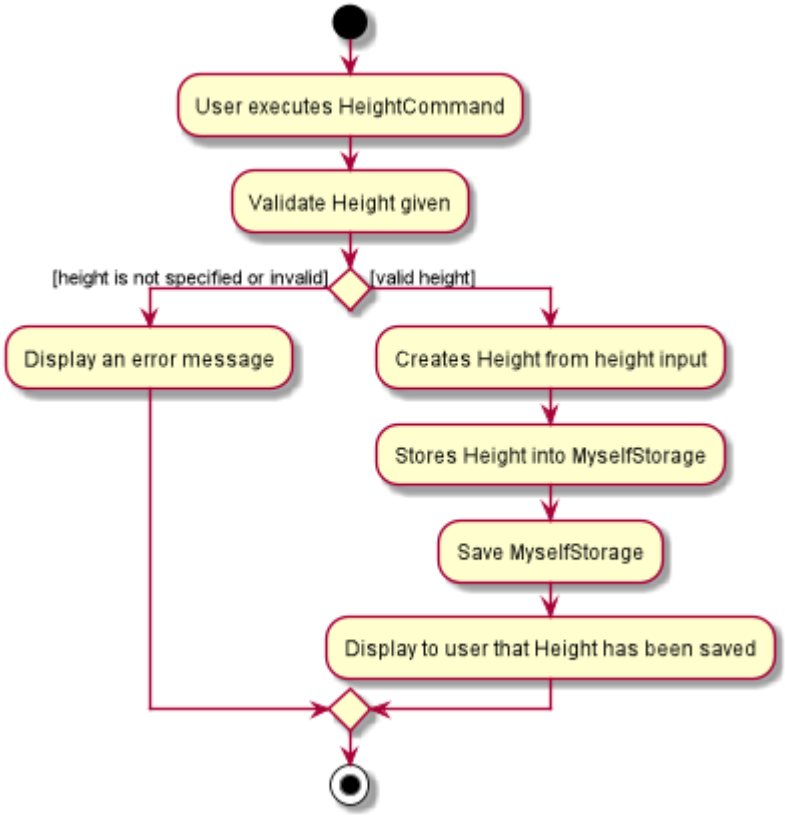


Figure 29. Height Command Activity Diagram

Structure of Height Command

In this section, you will learn more about the relationships between objects related to the `height` command.

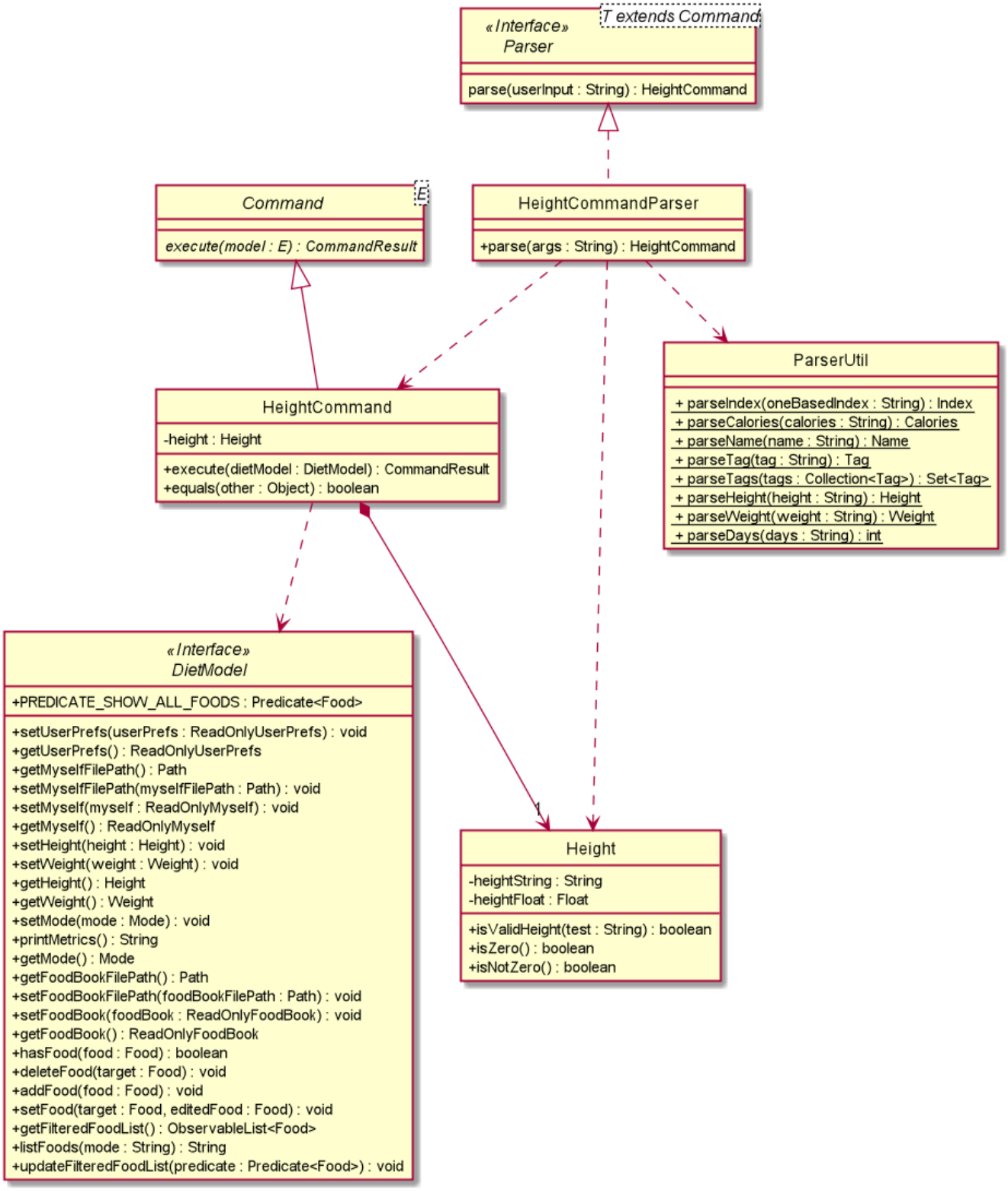


Figure 30. Height Command Class Diagram

The above class diagram shows the structure of the `HeightCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `HeightCommand`

Implementation of Height Command

The following is a detailed explanation of the operations `HeightCommand` performs.

1. The `HeightCommand#execute(DietModel dietModel)` method is executed and it validates that the specified `HEIGHT` to store is a valid Height. If valid, the height will be stored in the `Self` class.

2. The method `DietModel#setHeight(Height height)` will then be called to set the Height of the `Self` class. `Self#setHeight(Height height)` is invoked which makes a call to its internal Height to replace the value stored.
3. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.

Sequence diagram for Height Command

The following sequence diagram summarizes what happens during the execution of `height` command.

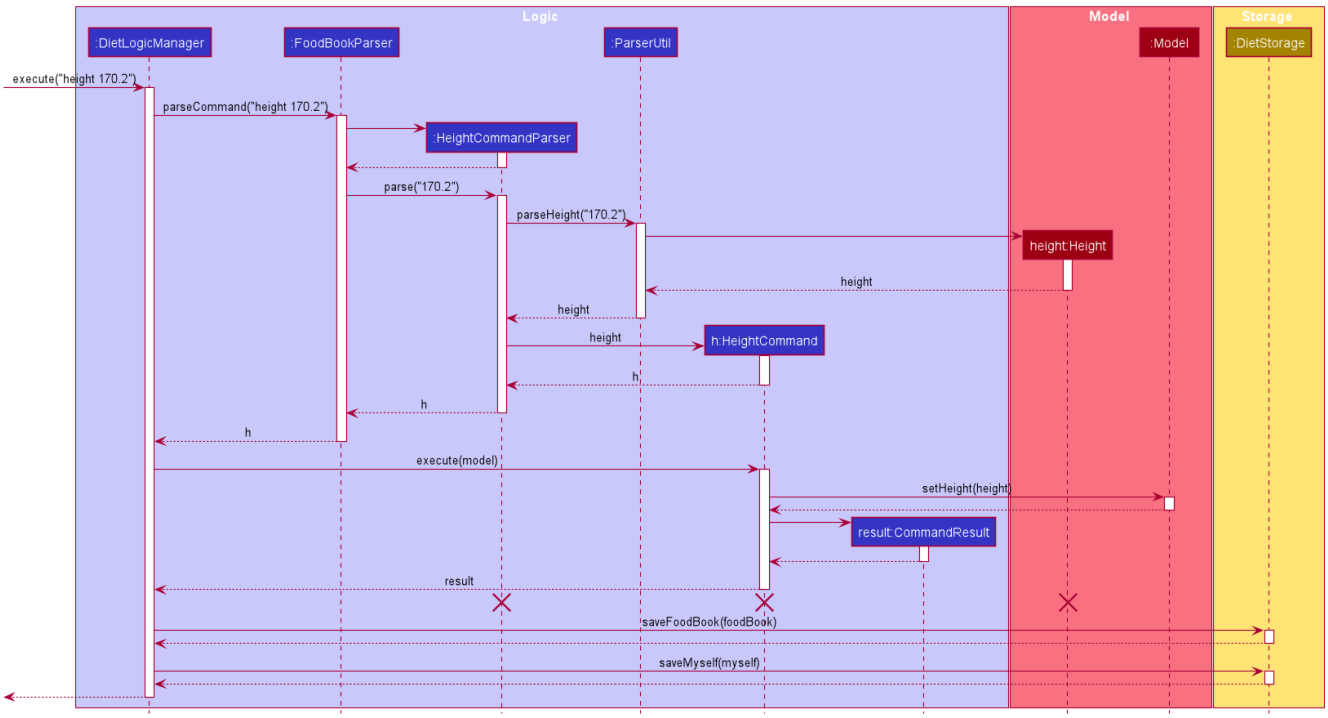


Figure 31. Height Command Sequence Diagram

4.1.7. Weight Command

In this section, we will learn more about how the `weight` command is implemented.

What is the Weight Command

The `weight` command allows the user to store their Weight into the Diet Tracker.

The `weight` command was implemented as `WeightCommand` in the `diettracker/logic/commands` package.

The `weight` command has the following input format:

`weight WEIGHT`

NOTE

- `WEIGHT` is a **compulsory** field.
- `WEIGHT` can range from >0 to <1000. `WEIGHT` can be input as a decimal.

The following activity diagram illustrates what happens when a user executes the `weight` command:

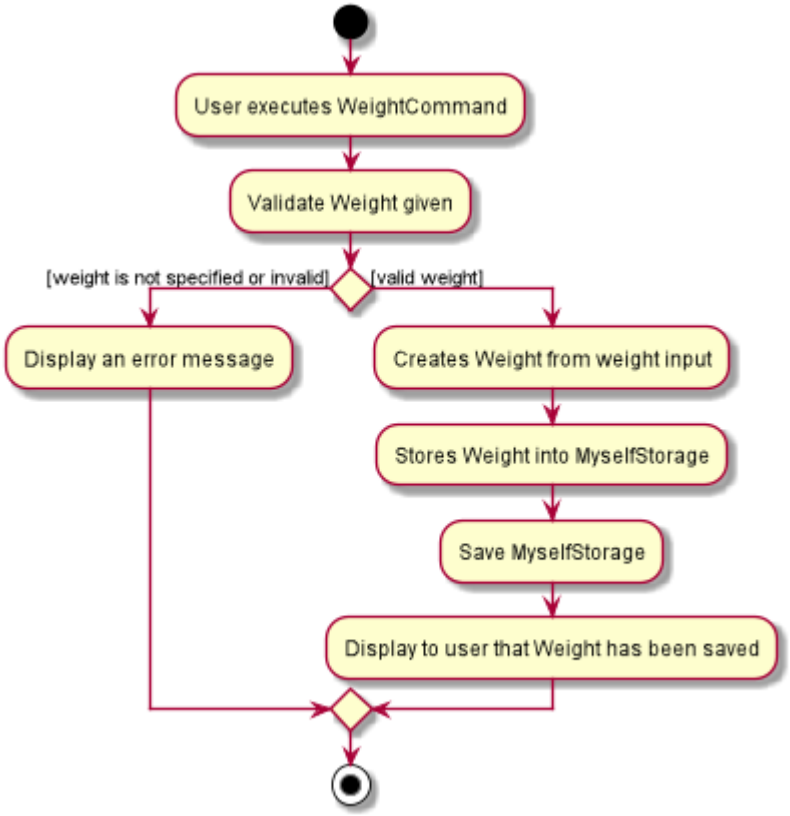


Figure 32. Weight Command Activity Diagram

Structure of Weight Command

In this section, you will learn more about the relationships between objects related to the `weight` command.

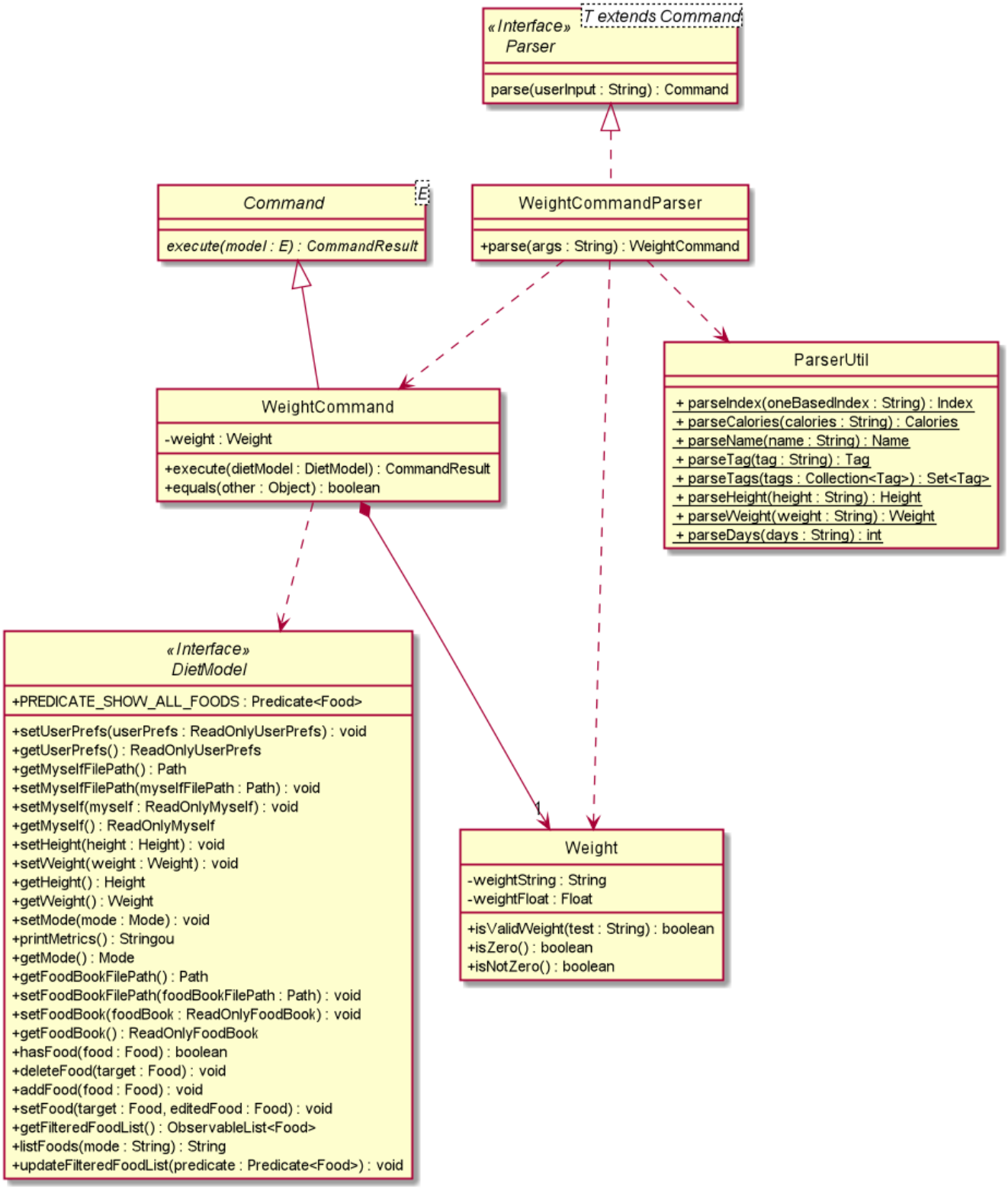


Figure 33. Weight Command Class Diagram

The above class diagram shows the structure of the `WeightCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `WeightCommand`

Implementation of Weight Command

The following is a detailed explanation of the operations `WeightCommand` performs.

1. The `WeightCommand#execute(DietModel dietModel)` method is executed and it validates that the specified `WEIGHT` to store is a valid Weight. If valid, the Weight will be stored in the `Self` class.

2. The method `DietModel#setWeight(Weight weight)` will then be called to set the Weight of the `Self` class. `Self#setWeight(Weight weight)` is invoked which makes a call to its internal Height to replace the value stored.
3. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.

Sequence diagram for Weight Command

The following sequence diagram summarizes what happens during the execution of `weight` command.

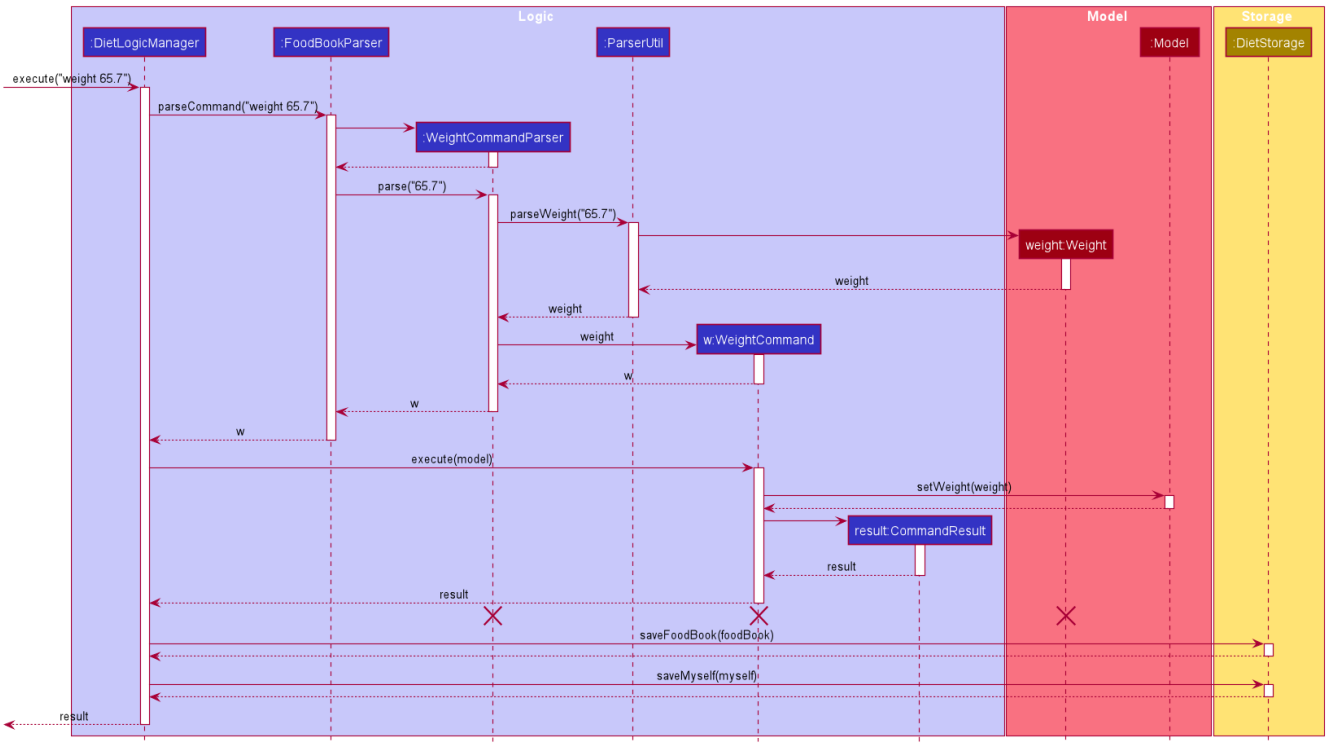


Figure 34. Weight Command Sequence Diagram

4.1.8. Mode Command

In this section, we will learn more about how the `mode` command is implemented.

What is the Mode Command

The `mode` command allows the user to store their Dieting Mode into the Diet Tracker.

The `mode` command was implemented as `ModeCommand` in the `diettracker/logic/commands` package.

The `mode` command has the following input format:

`mode [-l] [-g] [-m]`

> **NOTE** Users must only enter **EXACTLY ONE** of the given flags for the mode.

The following activity diagram illustrates what happens when a user executes the `mode` command:

Figure 35. Mode Command Activity Diagram

Structure of Mode Command

In this section, you will learn more about the relationships between objects related to the `mode` command.

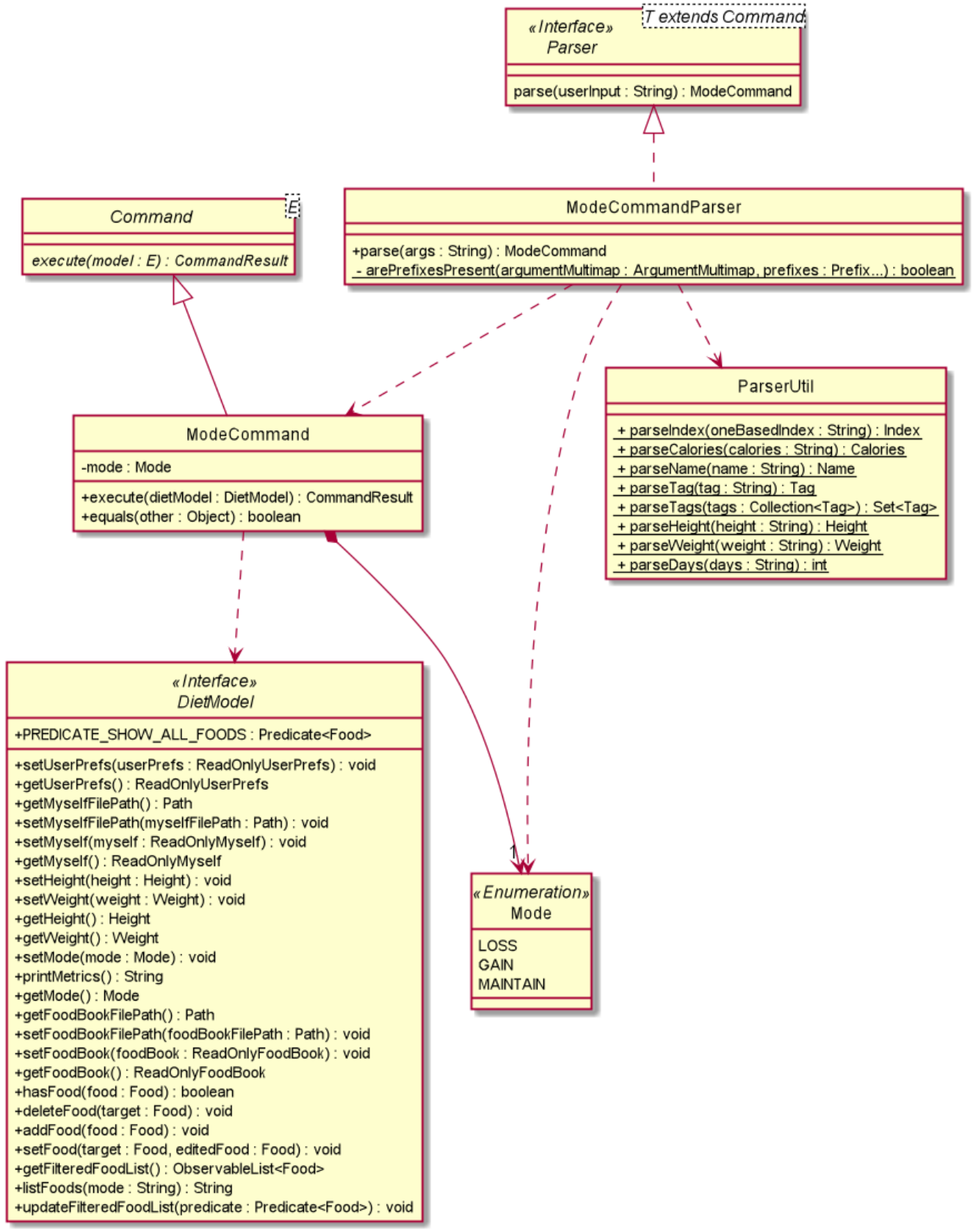


Figure 36. Mode Command Class Diagram

The above class diagram shows the structure of the `ModeCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `ModeCommand`

Implementation of Mode Command

The following is a detailed explanation of the operations ModeCommand performs.

1. The `ModeCommand#execute(DietModel dietModel)` method is executed and it validates that the specified `MODE` (based on the input flag) to store is a valid flag. If valid, the corresponding mode to the flag will be stored in the `Self` class.
2. The method `DietModel#setMode(Mode mode) will then be called to set the Mode of the 'Self` class. `Self#setMode(Mode mode)` is invoked which makes a call to its internal Mode to replace the value stored.
3. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.

Sequence diagram for Mode Command

The following sequence diagram summarizes what happens during the execution of `mode` command.

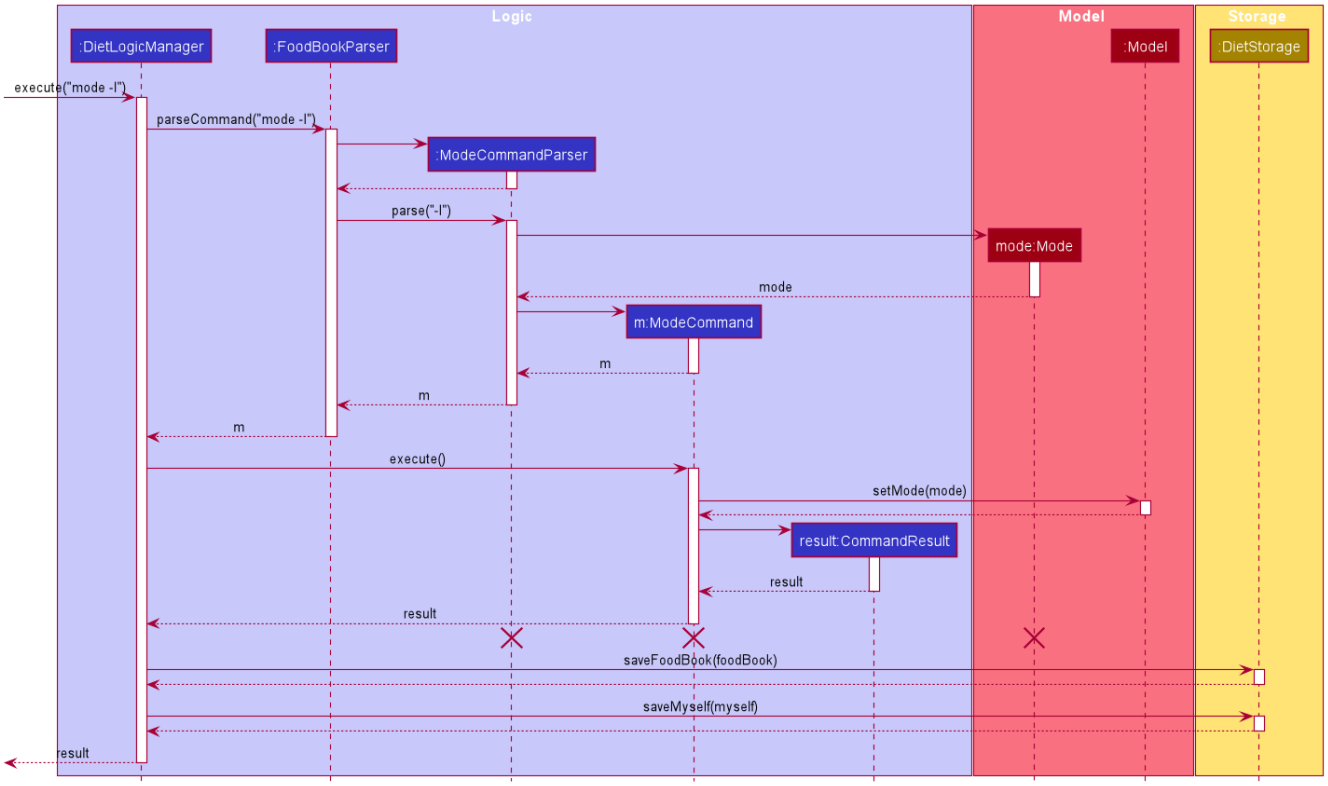


Figure 37. Mode Command Sequence Diagram

4.1.9. Metrics Command

In this section, we will learn more about how the `metrics` command is implemented.

What is the Metrics Command

The `metrics` command allows the user to check their health metrics. These include their Height, Weight and Dieting Mode.

The `metrics` command was implemented as `MetricsCommand` in the `diettracker/logic/commands` package.

The `metrics` command has the following input format:

`metrics`

The following activity diagram illustrates what happens when a user executes the `metrics` command:

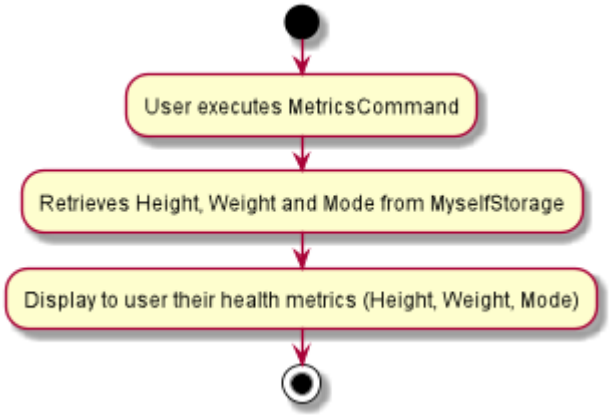


Figure 38. Metrics Command Activity Diagram

Structure of Metrics Command

In this section, you will learn more about the relationships between objects related to the `metrics` command.

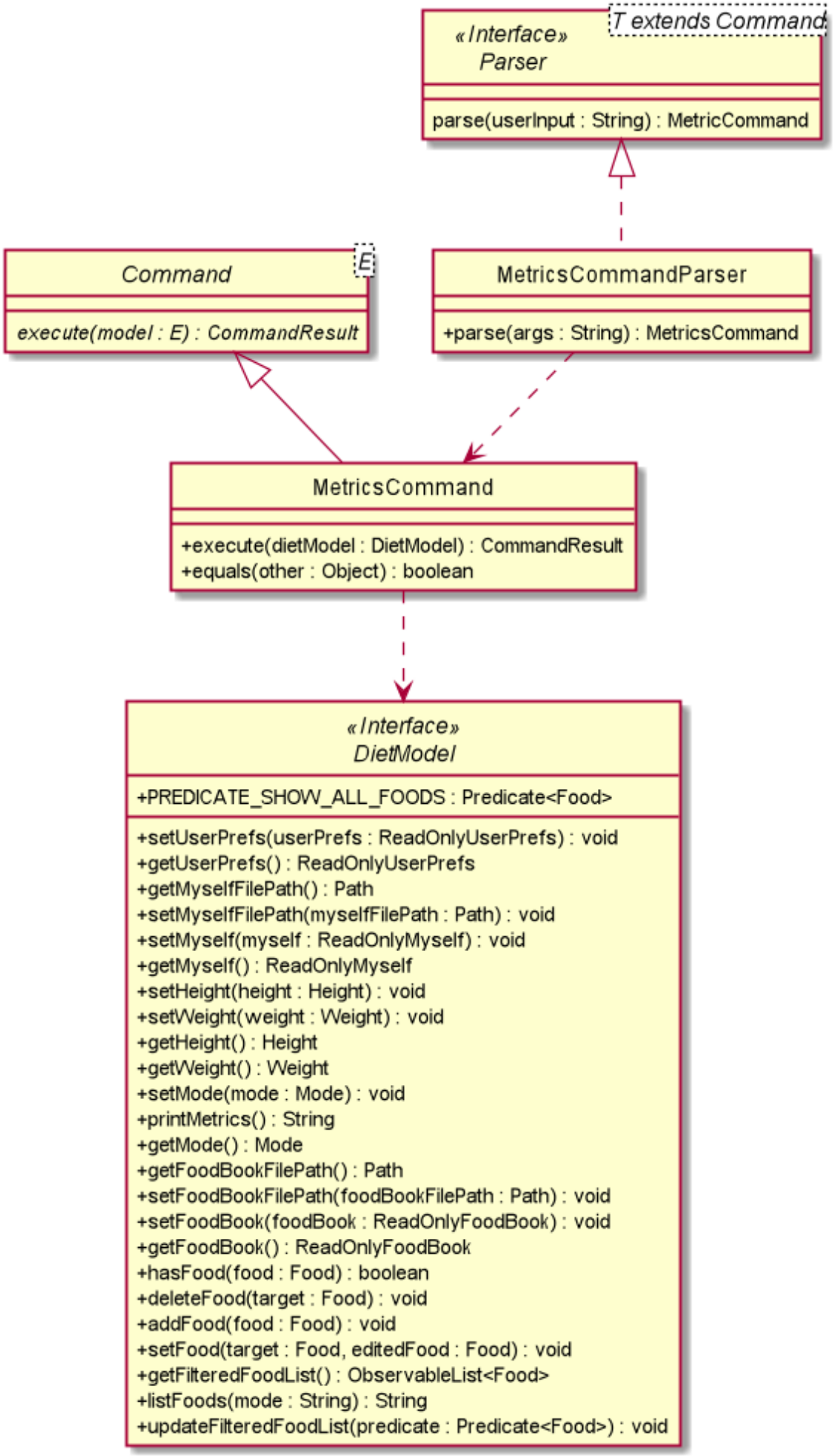

«Interface»
Parser
T extends Command
parse(userInput : String) : MetricCommand
Command
E
execute(model : E) : CommandResult
MetricsCommandParser
+parse(args : String) : MetricsCommand
MetricsCommand
+execute(dietModel : DietModel) : CommandResult
+equals(other : Object) : boolean
«Interface»
DietModel
+PREDICATE_SHOW_ALL_FOODS : Predicate<Food>
+setUserPrefs(userPrefs : ReadOnlyUserPrefs) : void
+getUserPrefs() : ReadOnlyUserPrefs
+getMyselfFilePath() : Path
+setMyselfFilePath(myselfFilePath : Path) : void
+setMyself(myself : ReadOnlyMyself) : void
+getMyself() : ReadOnlyMyself
+setHeight(height : Height) : void
+setWeight(weight : Weight) : void
+getHeight() : Height
+getWeight() : Weight
+setMode(mode : Mode) : void
+printMetrics() : String
+getMode() : Mode
+getFoodBookFilePath() : Path
+setFoodBookFilePath(foodBookFilePath : Path) : void
+setFoodBook(foodBook : ReadOnlyFoodBook) : void
+getFoodBook() : ReadOnlyFoodBook
+hasFood(food : Food) : boolean
+deleteFood(target : Food) : void
+addFood(food : Food) : void
+setFood(target : Food, editedFood : Food) : void
+getFilteredFoodList() : ObservableList<Food>
+listFoods(mode : String) : String
+updateFilteredFoodList(predicate : Predicate<Food>) : void

Figure 39. Metrics Command Class Diagram

The above class diagram shows the structure of the `MetricsCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `MetricsCommand`

Implementation of Metrics Command

The following is a detailed explanation of the operations MetricsCommand performs.

1. The `MetricsCommand#execute(DietModel dietModel)` method is executed.
2. The `DietModel#printMetrics()` method would then be called to print the User's Metrics.
3. If successful, a success message will be generated by `CommandResult` and it will be returned with the generated success message. Otherwise, an error message showing the correct command syntax is thrown as `CommandException`.

Sequence diagram for Metrics Command

The following sequence diagram summarizes what happens during the execution of `metrics` command.

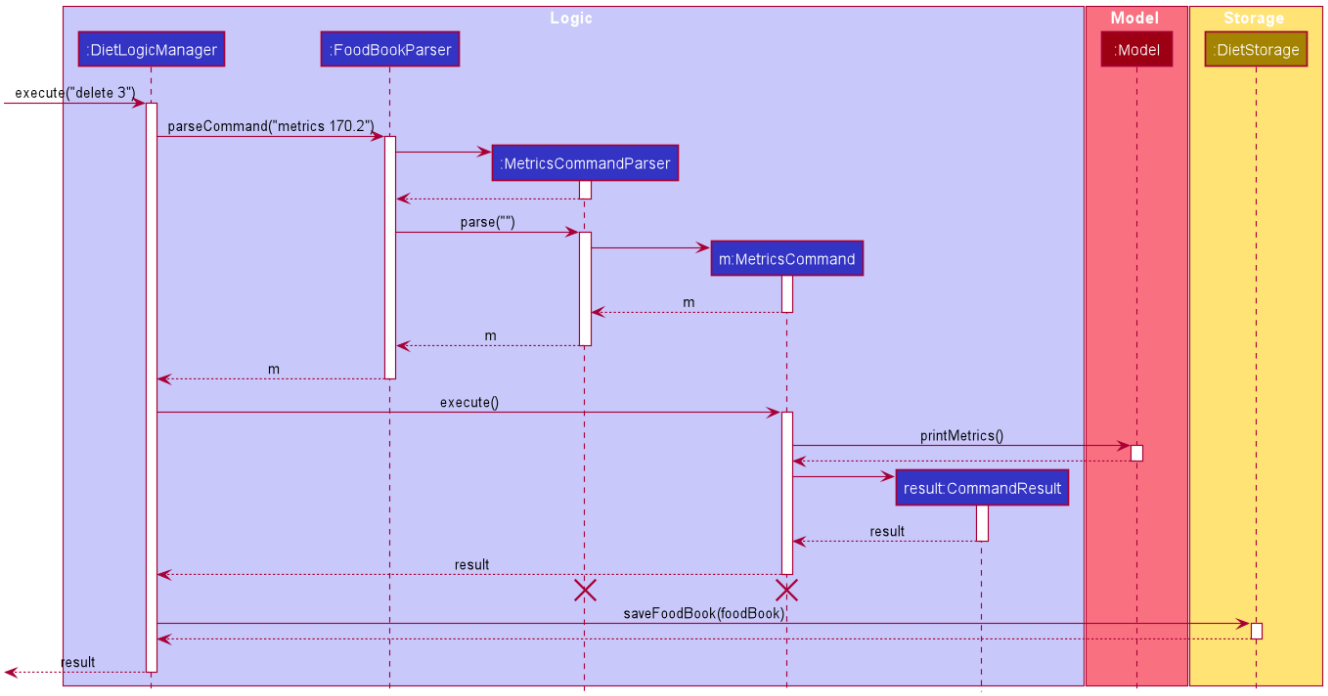


Figure 40. Metrics Command Sequence Diagram

4.2. Expense Splitter feature

The Expense Splitter feature is designed to aid our users with the splitting of large bills that involves meany people. The feature comprises of six commands namely.

- `AddItemCommand` - Creates an Item with its ItemPrice, Person(s) involved in splitting that Item and adds it to Receipt.
- `DeleteItemCommand` - Deletes an Item from the current Receipt and reduces the Person's amount accordingly.

- `ListReceiptCommand` - Lists the Item(s) in the current Receipt, its ItemPrice and Person(s) involved in splitting that Item.
- `ListAmountCommand` - Lists the Person(s) Name and Amount they owe the user.
- `DoneReceiptCommand` - Finalize the receipt, after which the Receipt will be immutable.
- `PaidCommand` - Reduces the Amount a Person owes.
- `ClearReceipt` - Clear the current Receipt to start a new Receipt.

Below is the activity diagram of the entire Expense Splitter.

Activity Diagram of Expense Splitter:

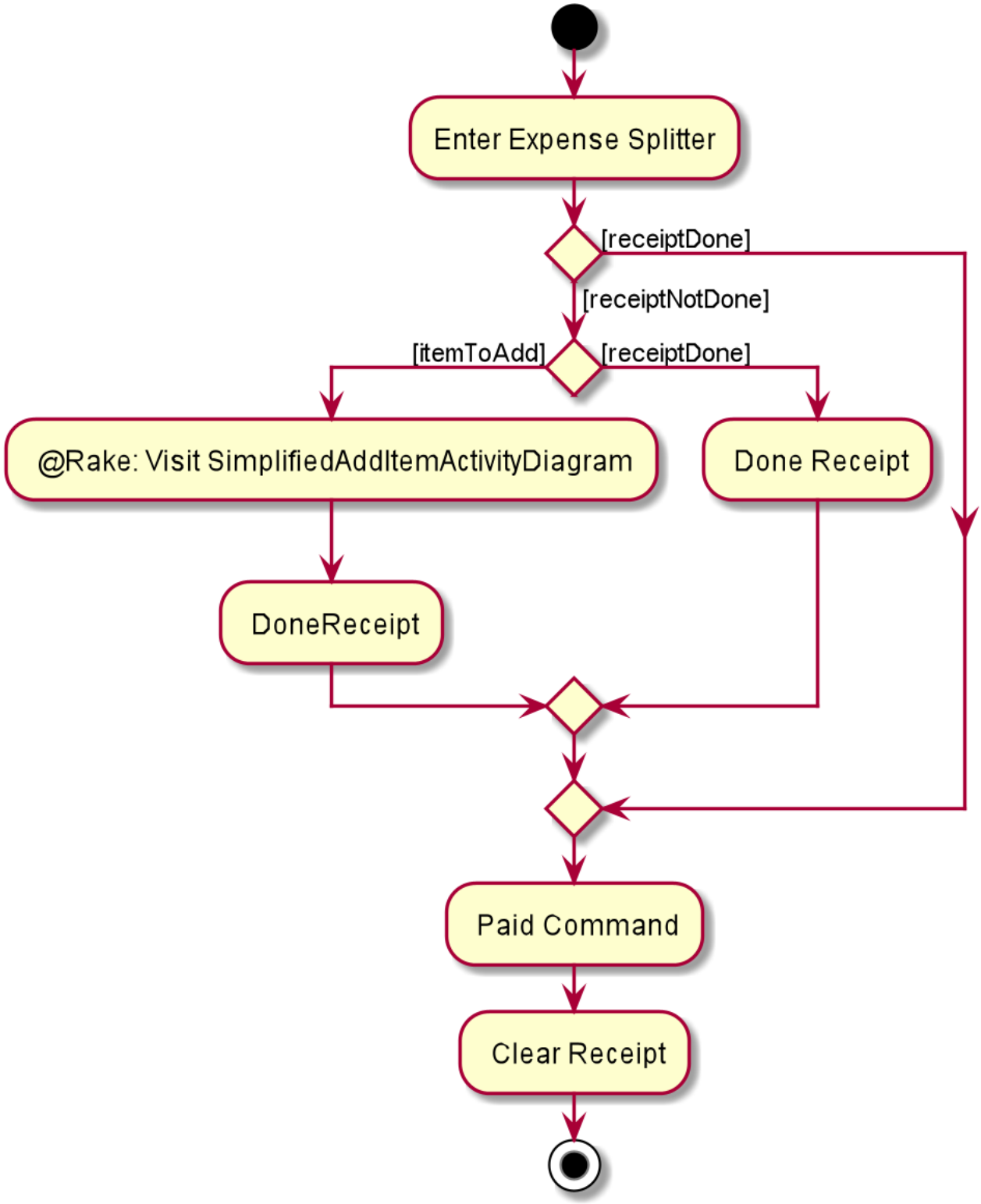


Figure 41. ExpenseSplitterActivityDiagram

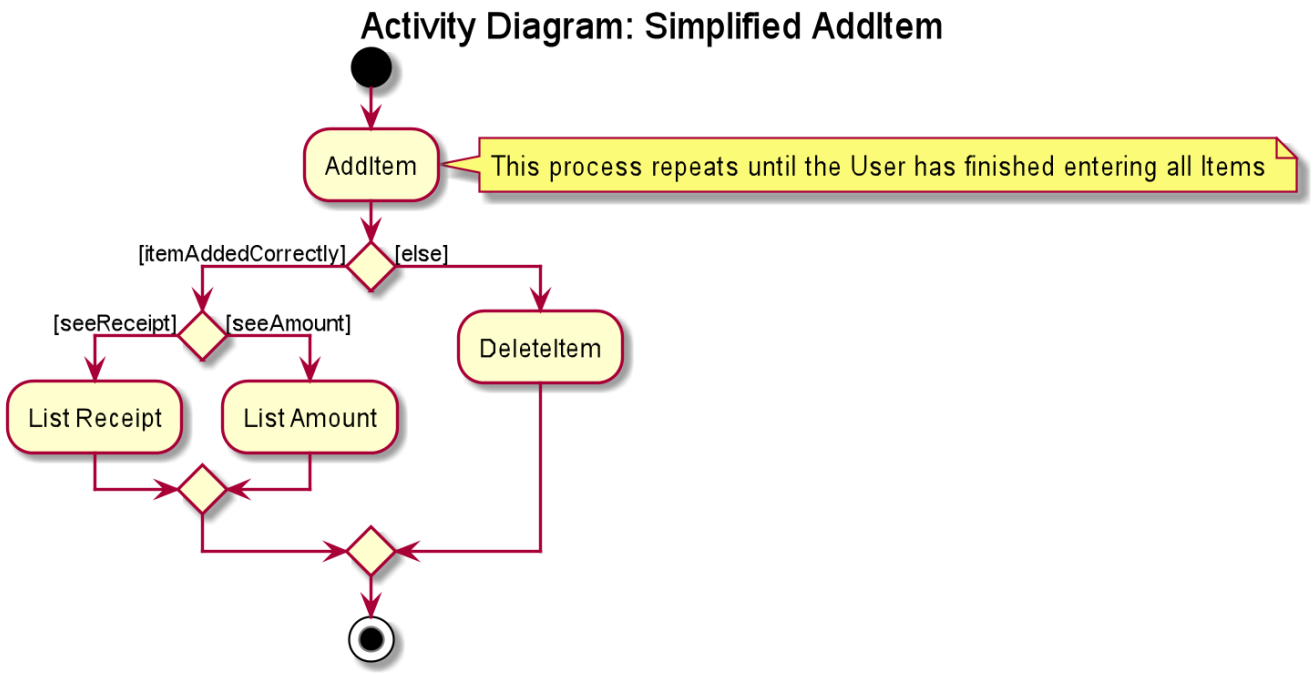


Figure 42. SimplifiedAddItemActivityDiagram

NOTE

SimplifiedAddItemActivityDiagram is not the actual AddItem Activity Diagram. It has been simplified to provide just enough information for the user to know about the rough workflow of Expense Splitter. A more detailed diagram of Add Item can be found in AddItemCommand.

4.2.1. Add Item Command

In this section, we will learn more about how the `additem` command is implemented.

What is the Add Item Command

The `additem` command allows the user to add an Item into the Receipt, along with the ItemPrice of the Item and the Persons involved in splitting the cost of that Item.

The `additem` command was implemented as `AddItemCommand` in the `expensesplitter/logic/commands` package.

The `additem` command has the following input format:

```
additem -i ITEMNAME -p ITEMPRICE -n NAME [-n NAME]…
```

NOTE

- `-i ITEMNAME` and `-p ITEMPRICE` are **compulsory** fields.
- There can be multiple `-n NAME`, however, a **minimum of 1** is required.
- `ITEMPRICE` can be up to 2 decimal places, i.e 7.99. There is **no need** to add the dollar sign ($).

The following activity diagram illustrates what happens when a user executes the `additem` command:

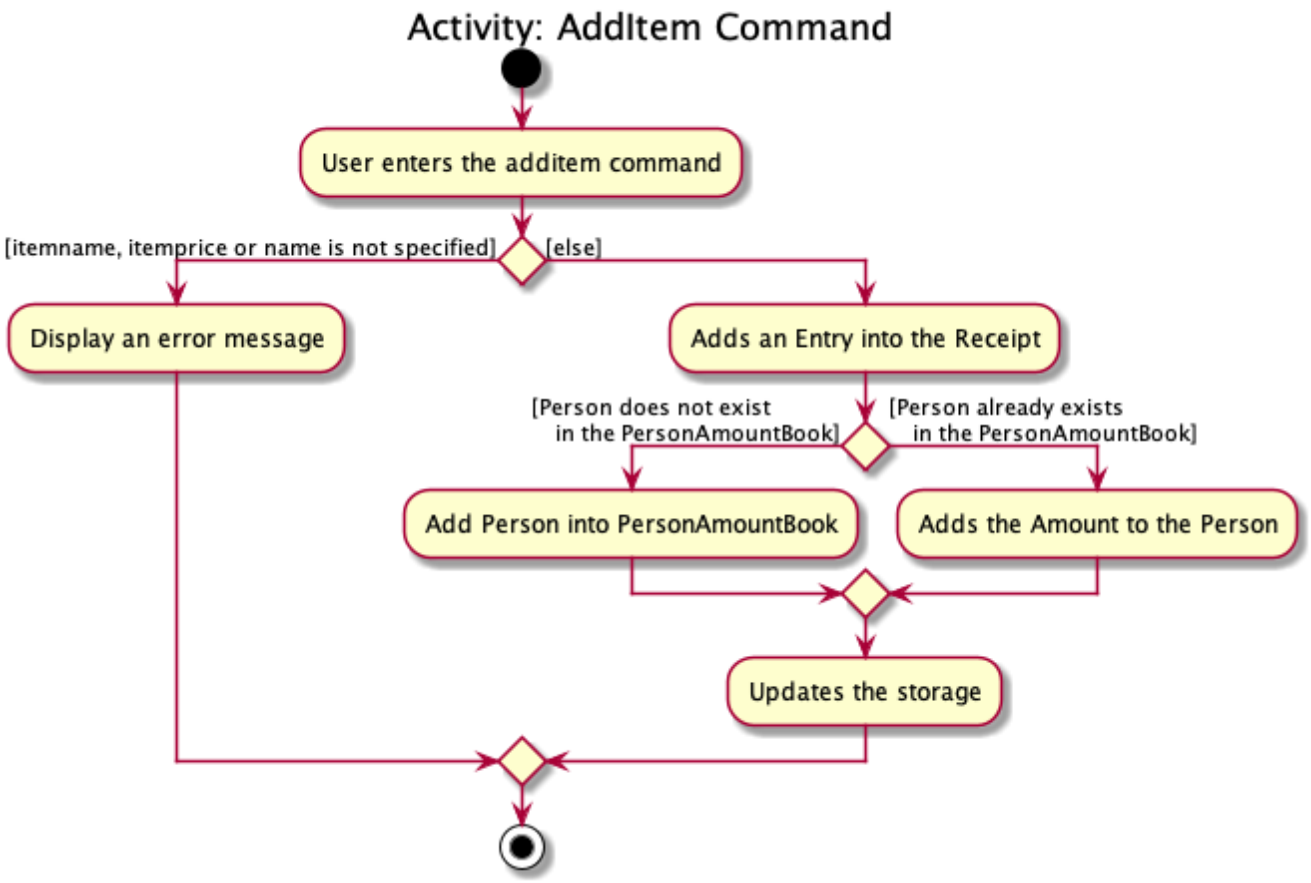


Figure 43. Add Item Command Activity Diagram

Structure of Add Item Command

In this section, you will learn more about the relationships between objects related to the `AddItemCommand`.

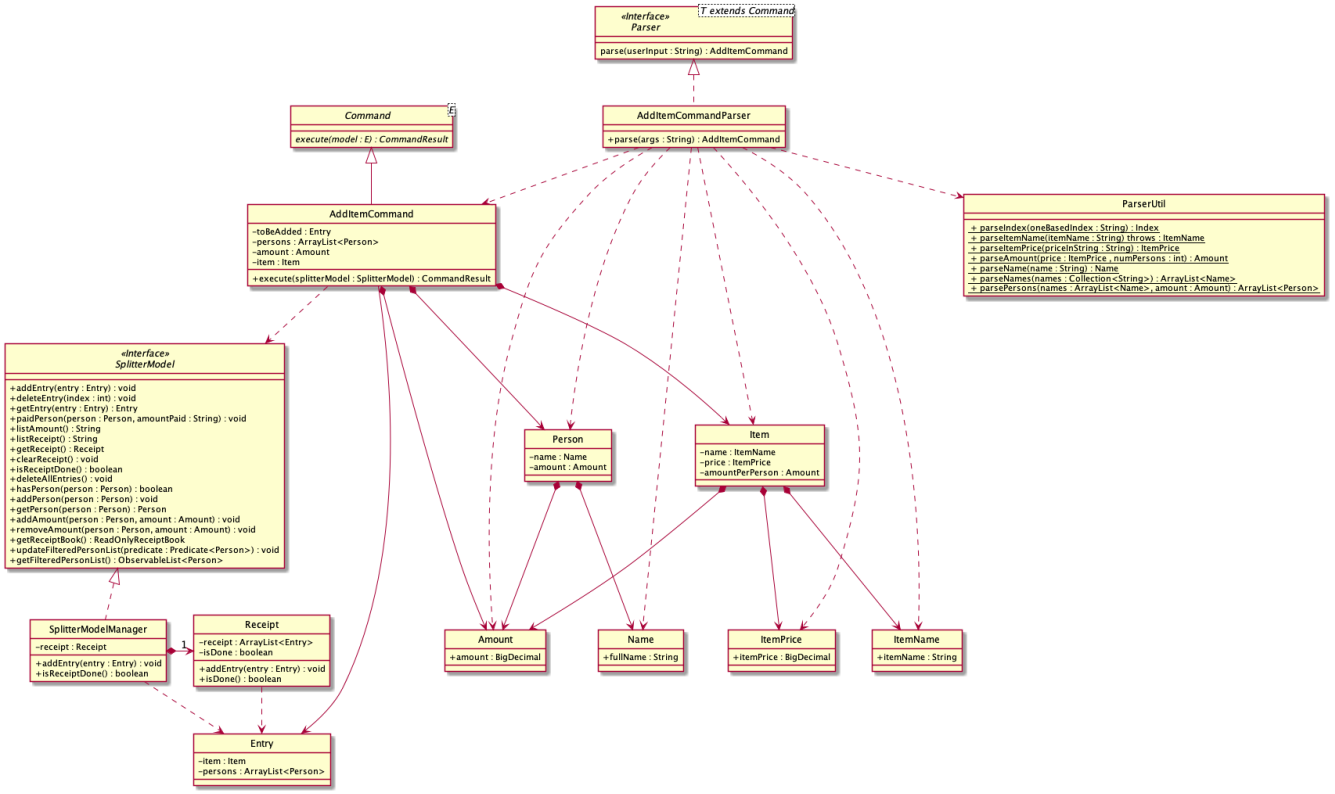


Figure 44. Add Item Command Class Diagram

The above class diagram shows the structure of the `AddItemCommand` and it's associated classes and interfaces. Some methods and fields have been left out because they are not of concern in the `AddItemCommand`.

Implementation of Add Item Command

The following is a detailed explanation of the operations `AddItemCommand` performs.

1. The `AddItemCommand#execute(SplitterModel splitterModel)` method is executed and it checks if the specified Item and list of Persons to be added are valid. If valid, a new Entry would be created with the specified Item and list of Persons.
2. The `SplitterModel#addEntry(Entry entry)` method would then be called to add the Entry into the Receipt.
3. For each Person in the list of Persons, the Person is first checked through the `PersonAmountBook#persons` using the `SplitterModel#hasPerson(Person person)` method to check if the person already exists.
4. If the person does not already exist, the method `SplitterModel#addPerson(Person person)` would be called to add the person, together with the amount, into the `PersonAmountBook#persons`.
5. If the Person exists, the Person would be retrieved from the `PersonAmountBook#persons` using the `SplitterModel#getPerson(Person person)` method, and then the amount would be added to that person using the `SplitterModel#addAmount(Person person, Amount amount)` method.

Sequence diagram for Add Item Command

The following sequence diagram summarizes what happens during the execution of `additem` command.

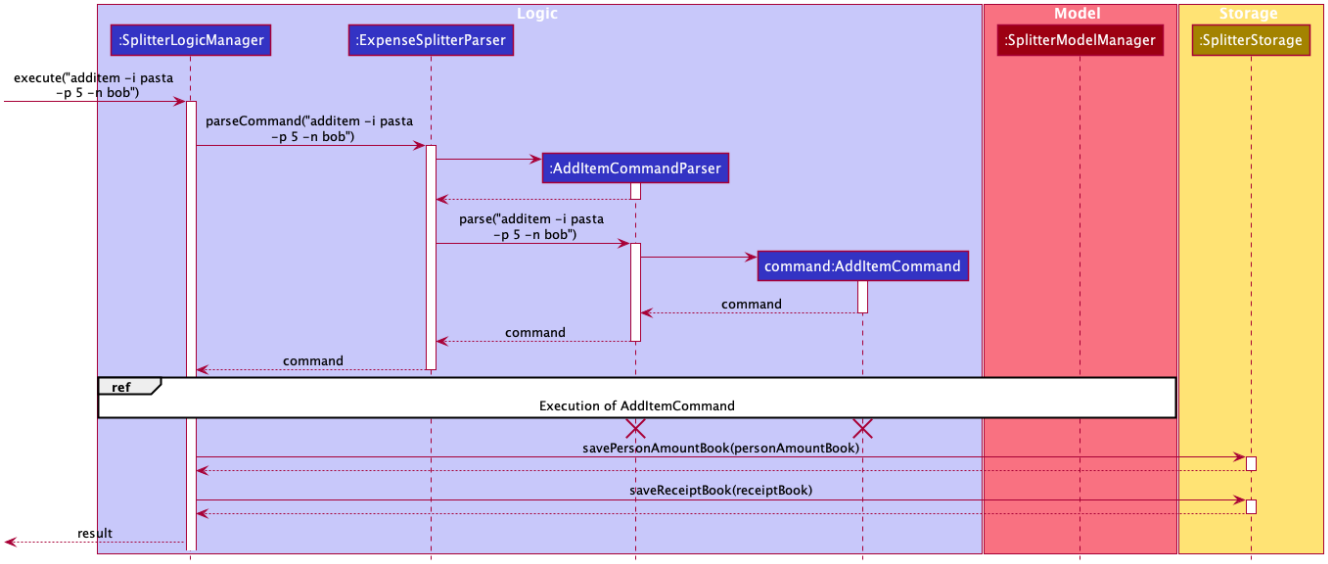


Figure 45. Add Item Command Sequence Diagram

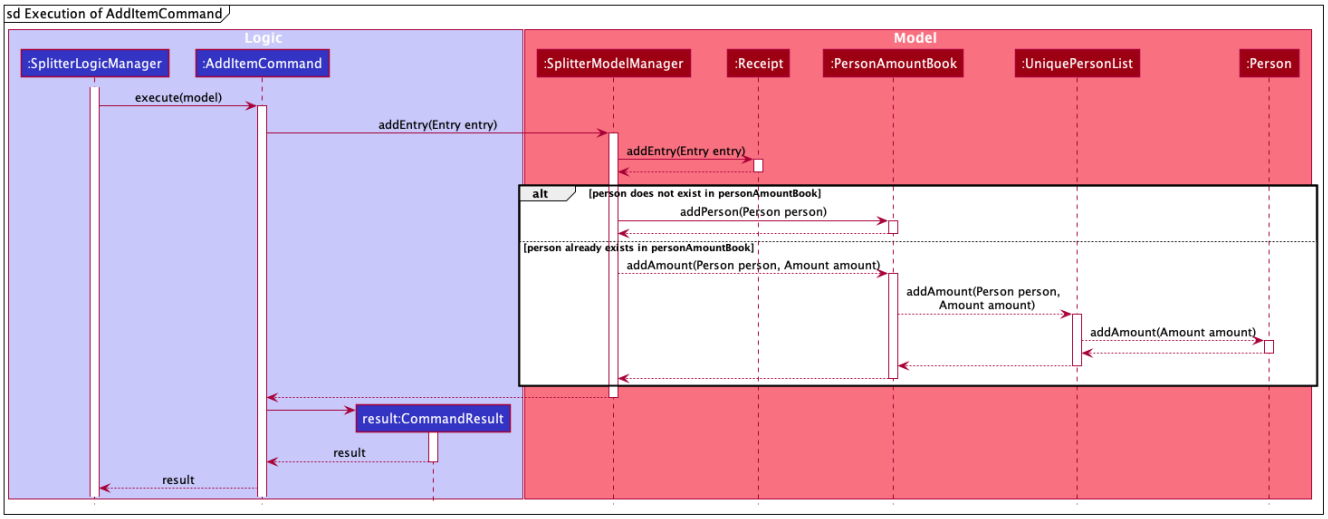


Figure 46. Execution of Add Item Command

4.2.2. Delete Item Command

In this section, we will learn more about how the `deleteitem` command is implemented.

What is the Delete Item Command

The `deleteitem` command allows users to remove the Item from the Receipt via the Index.

The `deleteitem` command was implemented as `DeleteItemCommand` in the `expensesplitter/logic/commands` package.

The `deleteitem` command has the following input format:

`deleteitem INDEX`

NOTE

- `INDEX` is a compulsory field.
- The Index of the Item can be retrieved by using the `listreceipt` command.

The following activity diagram illustrates what happens when a user executes the `deleteitem` command:

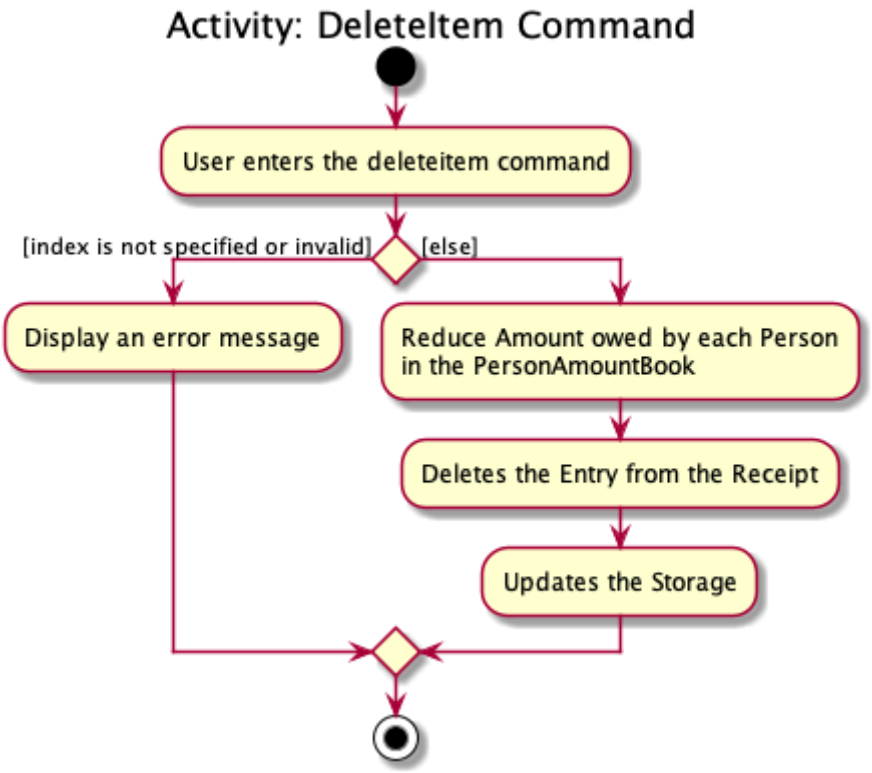


Figure 47. Delete Item Command Activity Diagram

Structure of Delete Item Command

In this section, you will learn more about the relationships between objects related to the `DeleteItemCommand`.

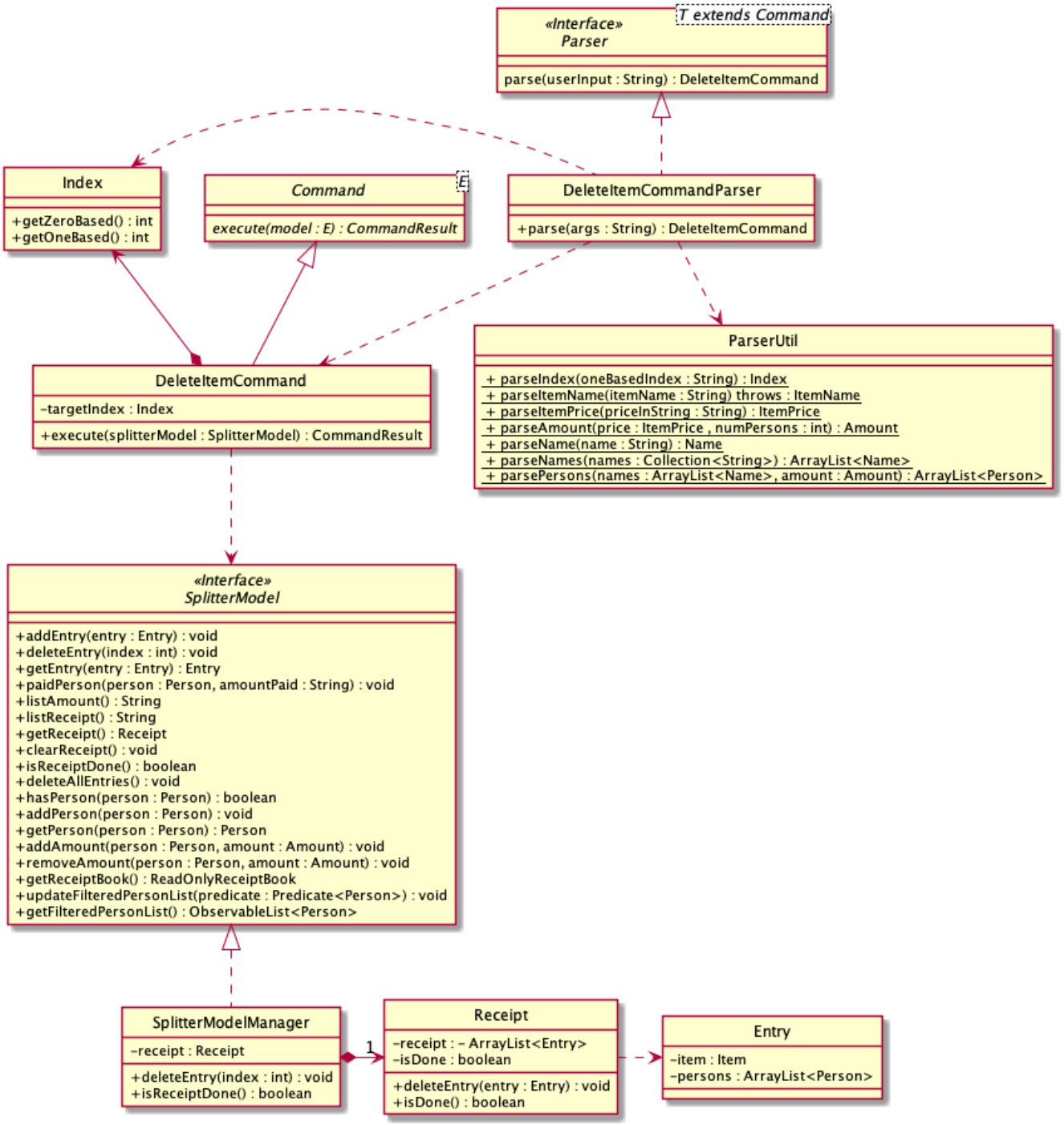


Figure 48. Delete Item Command Class Diagram

The above class diagram shows the structure of the `DeleteItemCommand` and it's associated classes and interfaces. Some methods and fields have been left out because they are not of concern in the `DeleteItemCommand`.

Implementation

The following is a detailed explanation of the operations `DeleteItemCommand` performs.

1. The `DeleteItemCommand#execute(SplitterModel splitterModel)` method is executed and it validates that the specified Index to delete is within range. If valid, the Entry to be deleted will be retrieved from Receipt using its Index.
2. The method `SplitterModel#getEntry(Index index)` is called to retrieve the current Entry, which subsequently retrieves the current Item using the `Entry#getItem()` method and the

amountPerPerson associated with it via the `Item#getAmountPerPerson()` method. The list of Persons are also retrieved via the `Entry#getPersonsList()` method.

3. For each Person in the list of Persons, the amount is subtracted from the current amount owed by the Person.
4. The method `SplitterModel#deleteEntry(int index)` will then be called to remove the Item from the Receipt. `Receipt#deleteEntry(int index)` is invoked which makes a call to its internal list to remove the specified Item.

Sequence Diagram for Delete Item Command

The following sequence diagram summarizes what happens during the execution of `deleteitem` command.

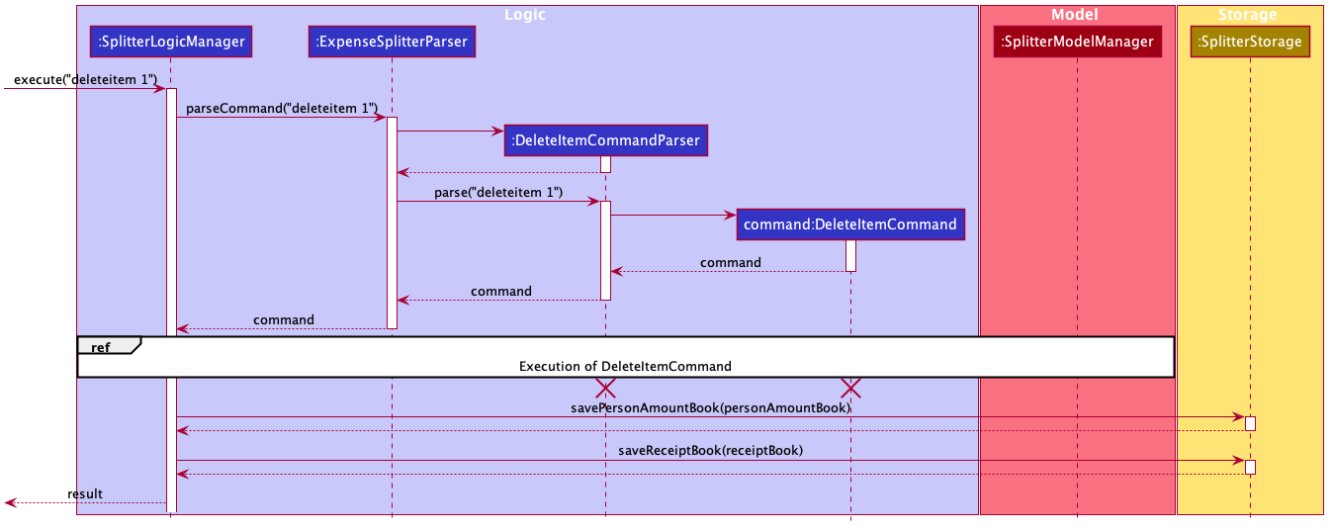


Figure 49. Delete Item Command Sequence Diagram

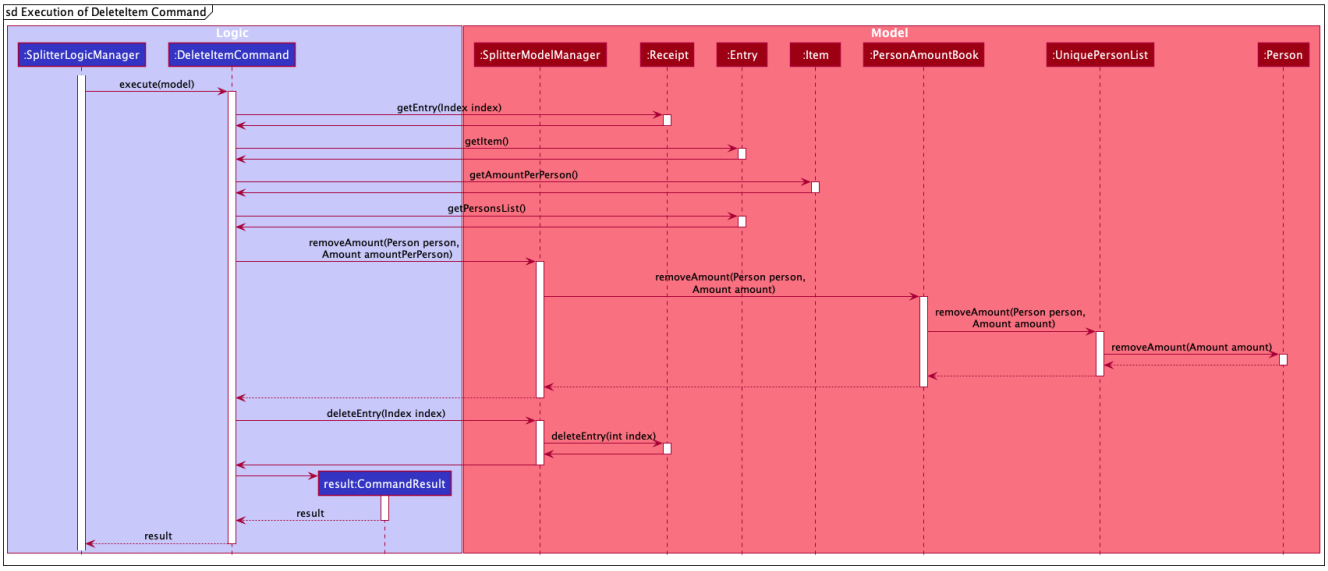


Figure 50. Execution of Delete Item Command

4.2.3. List Receipt Command

In this section, we will learn more about how the `listreceipt` command is implemented.

What is the List Receipt Command

The `listreceipt` command allows user to find out the current Items in the receipt.

The `listreceipt` command was implemented as a `ListReceiptCommand` in the `expensesplitter/logic/commands` package.

The `listreceipt` has the following input format:

`listreceipt`

NOTE

- Each entry in the receipt has the item's name, price and person(s) involved in splitting that item.
- When you enter `clearrreceipt` it deletes the old receipt's data. Use it with caution!

The following activity diagram illustrates what happens when a user executes `listreceipt` command:

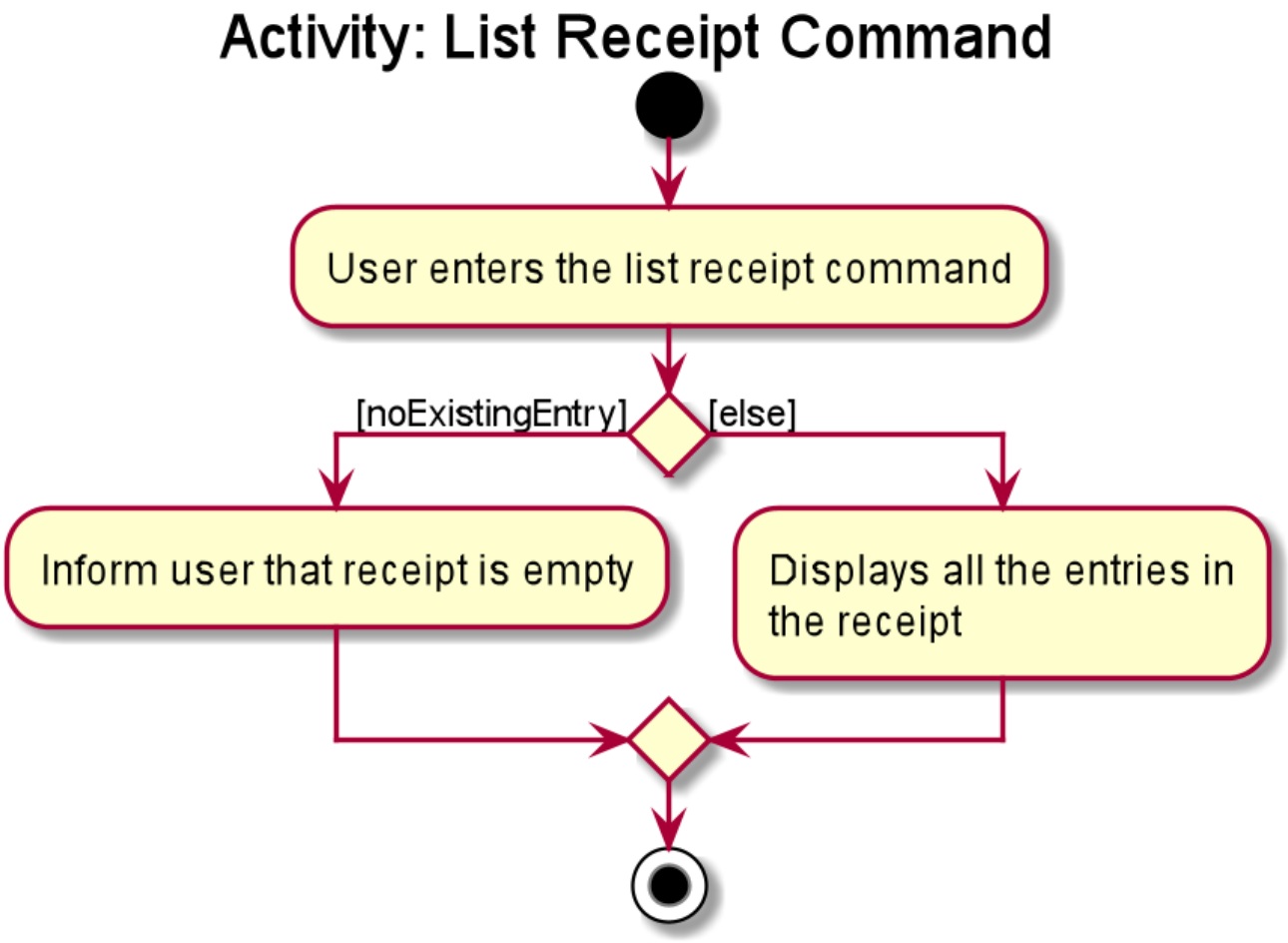


Figure 51. List Receipt Activity Diagram

Structure of List Receipt Command

In this section, you will learn more about the relationships between objects related to the `ListReceiptCommand`.

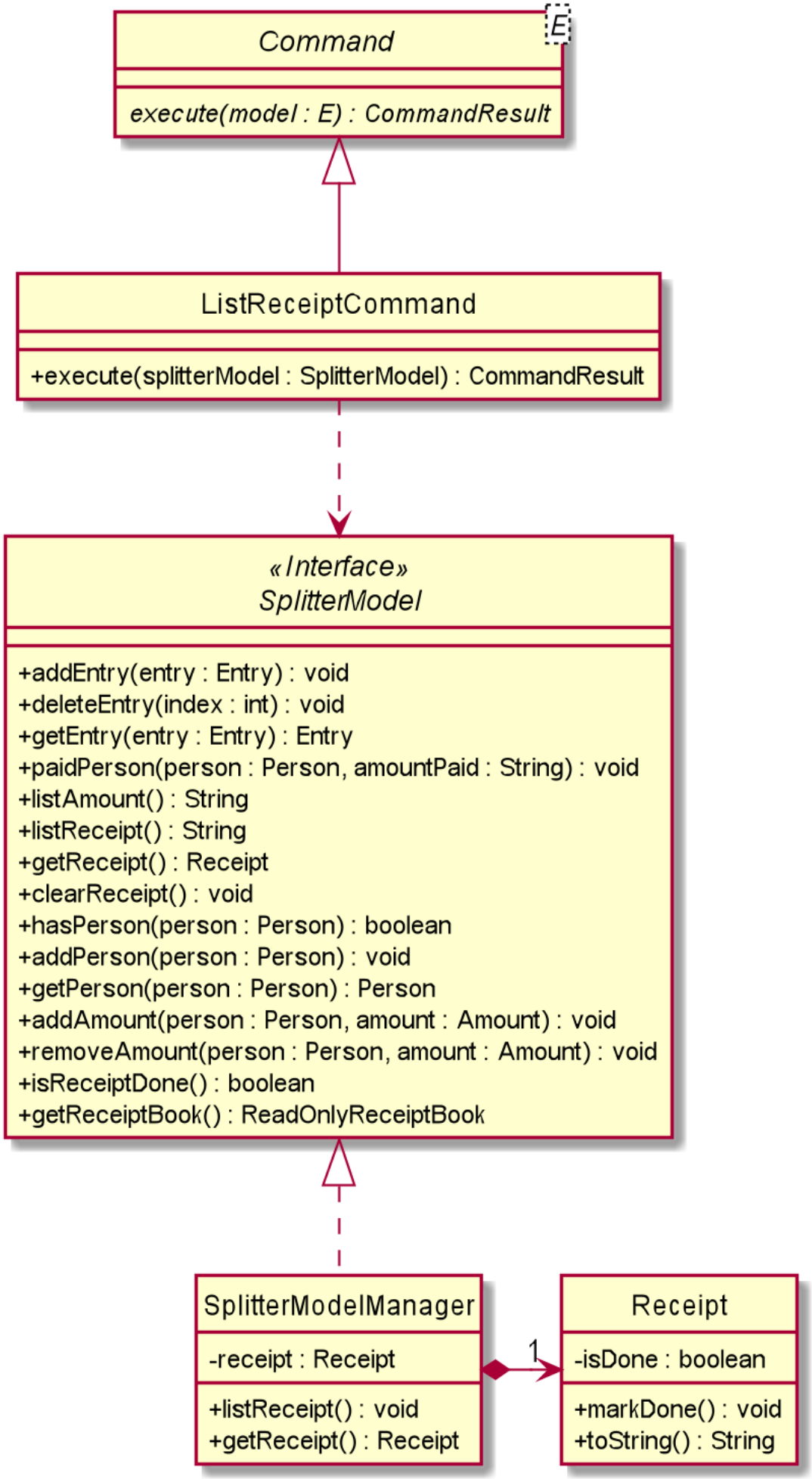

Command
E
execute(model : E) : CommandResult
ListReceiptCommand
+execute(splitterModel : SplitterModel) : CommandResult
«Interface»
SplitterModel
+addEntry(entry : Entry) : void
+deleteEntry(index : int) : void
+getEntry(entry : Entry) : Entry
+paidPerson(person : Person, amountPaid : String) : void
+listAmount() : String
+listReceipt() : String
+getReceipt() : Receipt
+clearReceipt() : void
+hasPerson(person : Person) : boolean
+addPerson(person : Person) : void
+getPerson(person : Person) : Person
+addAmount(person : Person, amount : Amount) : void
+removeAmount(person : Person, amount : Amount) : void
+isReceiptDone() : boolean
+getReceiptBook() : ReadOnlyReceiptBook
SplitterModelManager
-receipt : Receipt
+listReceipt() : void
+getReceipt() : Receipt
1
Receipt
-isDone : boolean
+markDone() : void
+toString() : String

Figure 52. List Receipt Command Class Diagram

The above class diagram shows the structure of the `ListReceiptCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `ListReceiptCommand`

Implementation of List Receipt Command

The following is a detailed explanation of the operations `ListReceiptCommand` performs.

1. The `ListReceiptCommand#execute(SplitterModel splitterModel)` method is executed.
2. The method `SplitterModel#listReceipt()` will then be called to return the list of entries currently in that Receipt.
3. The method `Receipt#toString()` will use StringBuilder to build the string of the Items(s) currently in Receipt by calling `Entry.toString()` for entry. After all entries are done, `Receipt#toString()` would have finish building the string and will return to SplitterModelManager.
4. 4. SplitterModelManager will then pass the String into CommandResult where it will be printed under the UI component.

Sequence Diagram for List Receipt Command

The following sequence diagram summarizes what happens during the execution of `listreceipt` command.

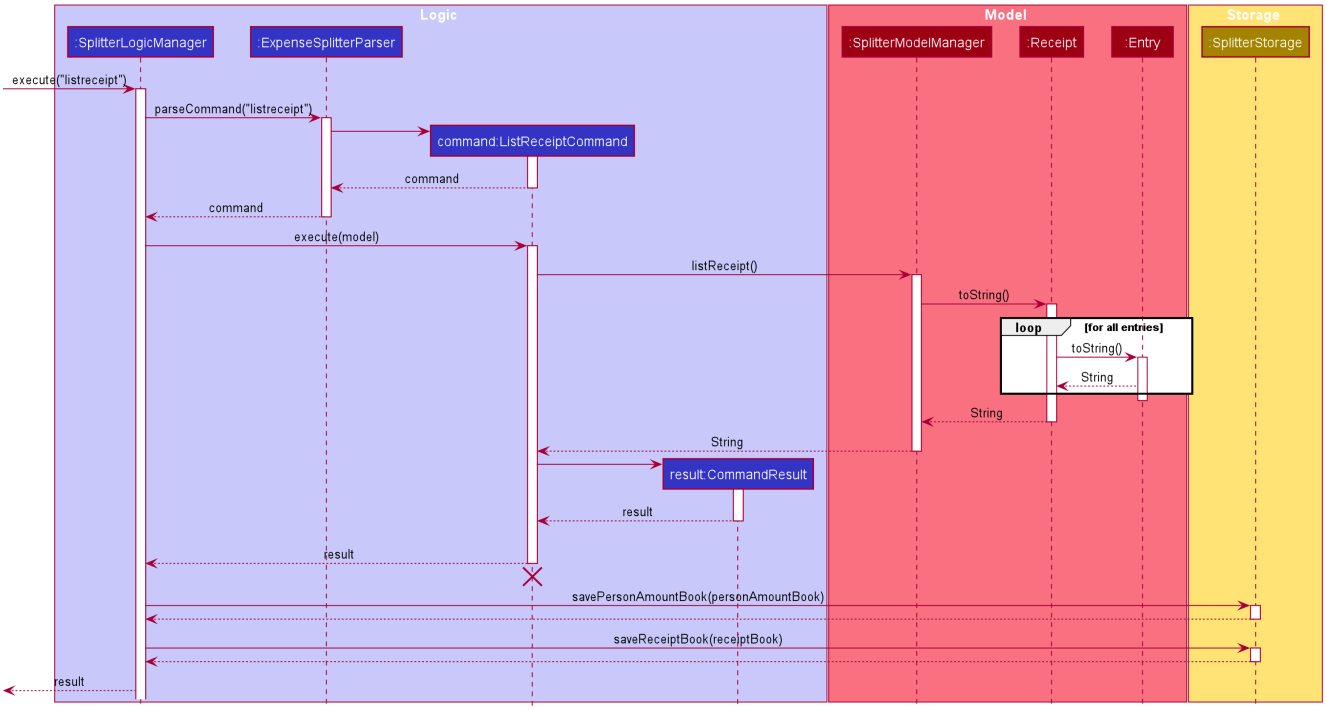


Figure 53. List Receipt Command Sequence Diagram

4.2.4. List Amount Command

In this section, we will learn more about how the `listamount` command is implemented.

What is the List Amount Command

The `listamount` command allows users to find out how much each Person owes them.

The `listamount` command was implemented as a `ListAmountCommand` in the `expensesplitter/logic/commands` package.

The `listamount` command has the following input format:

`listamount`

NOTE

- The Person and amount owed will be automatically saved after each command.
- A person is deleted after they have completely paid the amount they owe.

The following activity diagram illustrates what happens when a user executes `listamount` command.

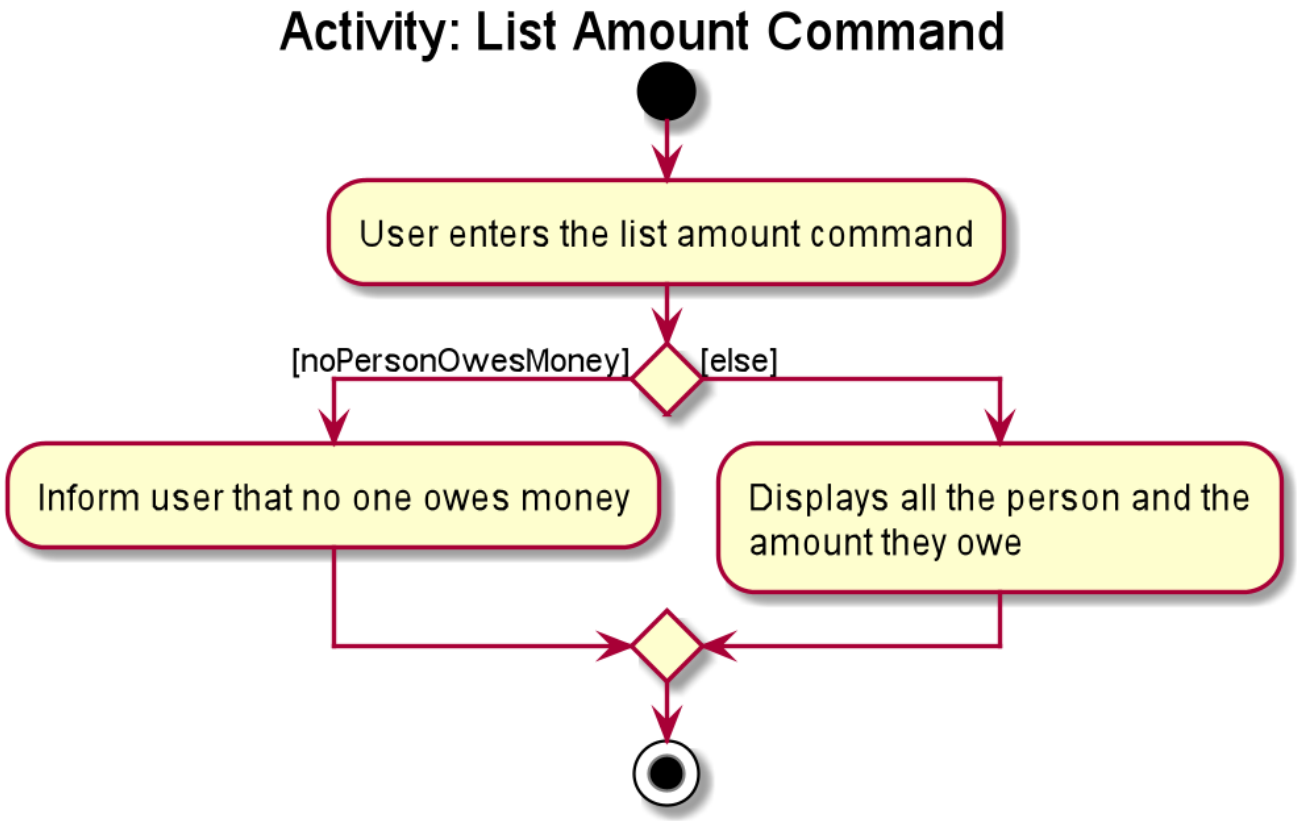


Figure 54. List Amount Activity Diagram

Structure of List Amount Command

In this section, you will learn more about the relationships between objects related to the `ListAmountCommand`.

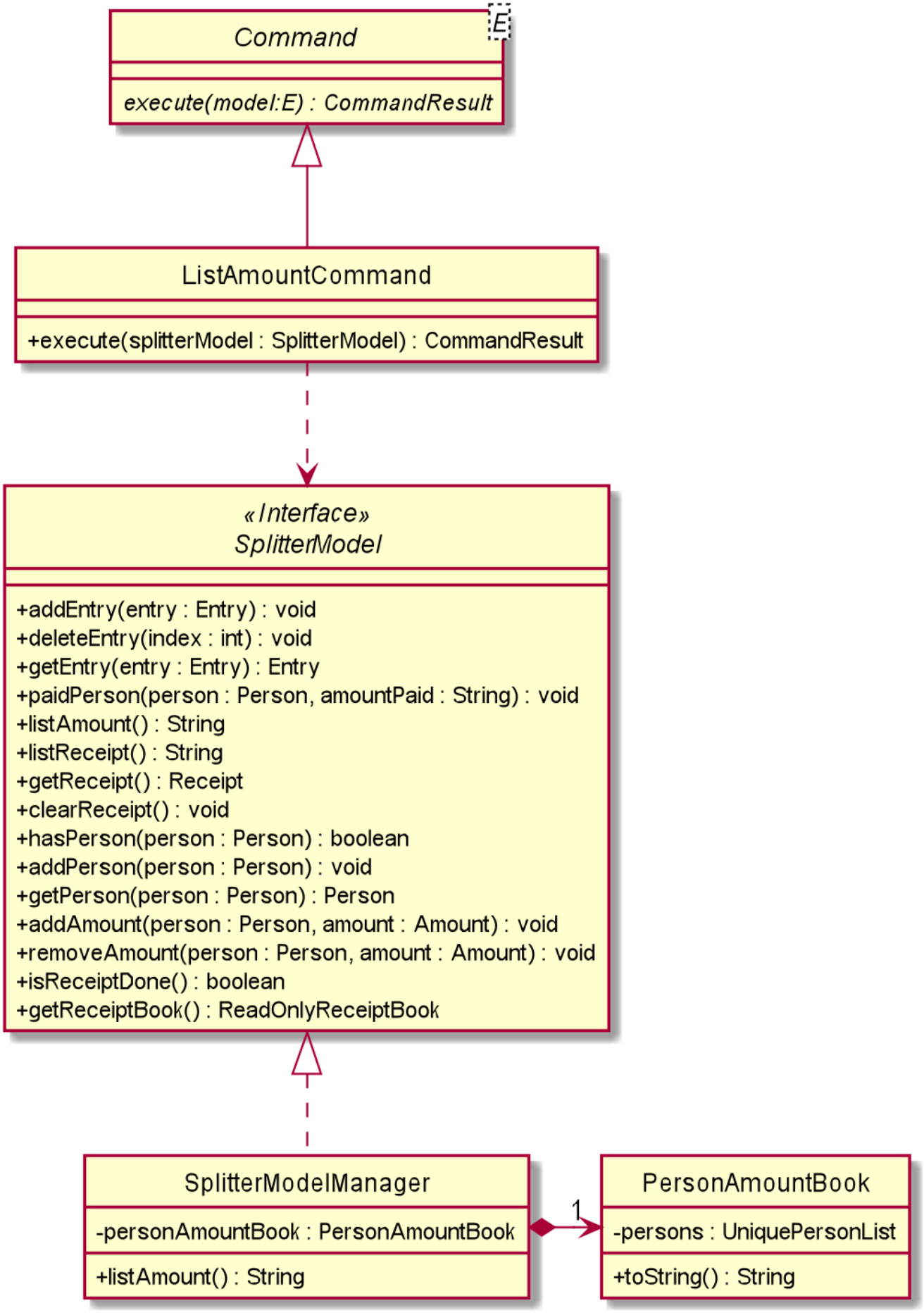


Figure 55. List Amount Command Class Diagram

The above class diagram shows the structure of the `ListAmountCommand` and its associated classes and

interfaces. Some methods and fields are left out because they are not of concern in `ListAmountCommand`

Implementation of List Amount Command

The following is a detailed explanation of the operations ListAmountCommand performs.

1. The `ListAmountCommand#execute(SplitterModel splitterModel)` method is executed.
2. The method `SplitterModel#listAmount()` will then be called to return the list of Person(s) with their amount.
3. `PersonAmountBook#toString()` will convert list of person in the list to the expected format and return it to SplitterModelManager.
4. SplitterModelManager will then pass the String into CommandResult where it will be printed under the UI component.

Sequence Diagram for List Amount Command

The following sequence diagram summarizes what happens during the execution of `listamount` command.

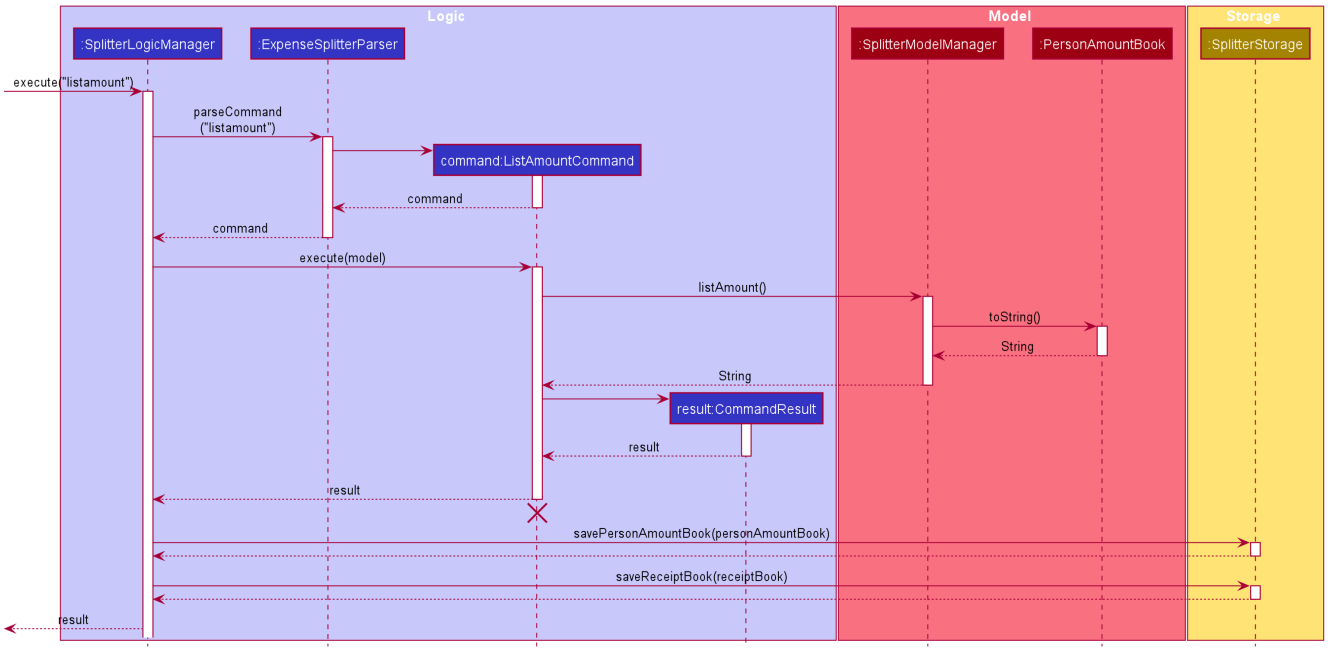


Figure 56. List Amount Command Sequence Diagram

4.2.5. Done Receipt Command

In this section, we will learn more about how the `donereceipt` command is implemented.

What is the Done Receipt Command

The `donereceipt` command allows user to finalize the entries in the receipt. After this command is executed, the entries in the receipt are immutable.

The `donereceipt` command was implemented as a `DoneReceiptCommand` in the `expensespliter/logic` package.

The `donereceipt` has the following input format:

`donereceipt`

NOTE	The receipt will not be editable after this command is executed thus ensuring all entries are inputted correctly. The User can use `listreceipt` to check current entries in the receipt, `deleteitem` and `additem` to delete and add the correct item back.

The following activity diagram illustrates what happens when a user executes `donereceipt` command:

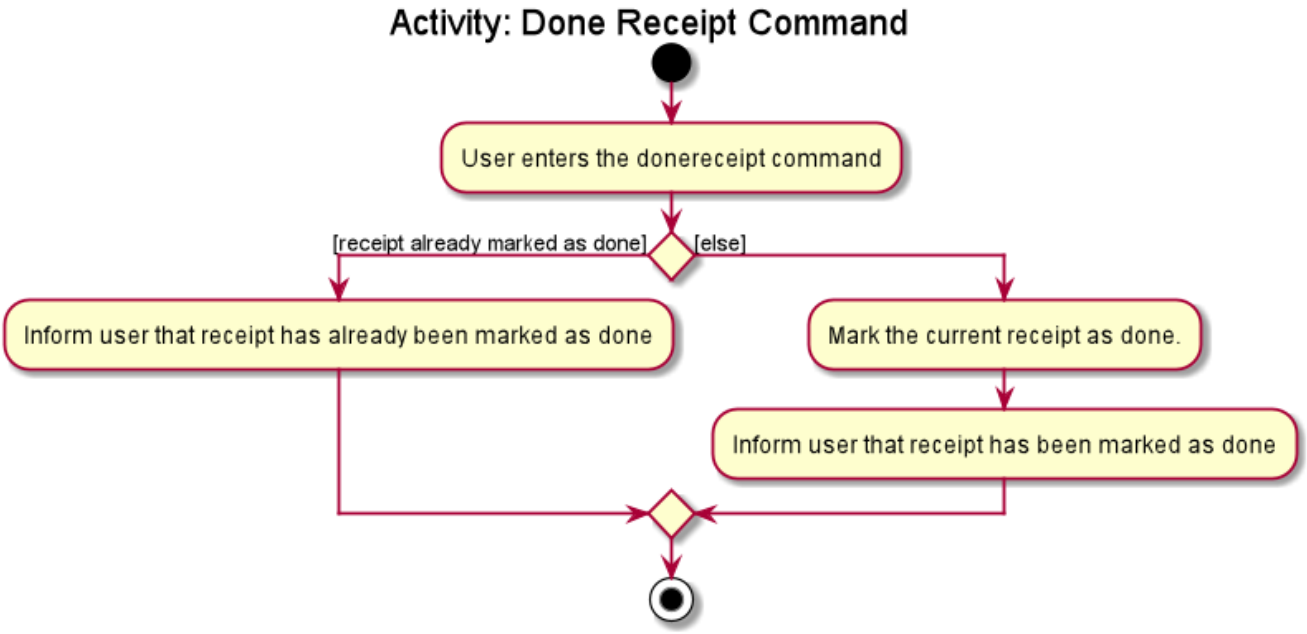


Figure 57. Done Receipt Command Activity Diagram

Structure of Done Receipt Command

In this section, you will learn more about the relationships between objects related to the `donereceipt` command.

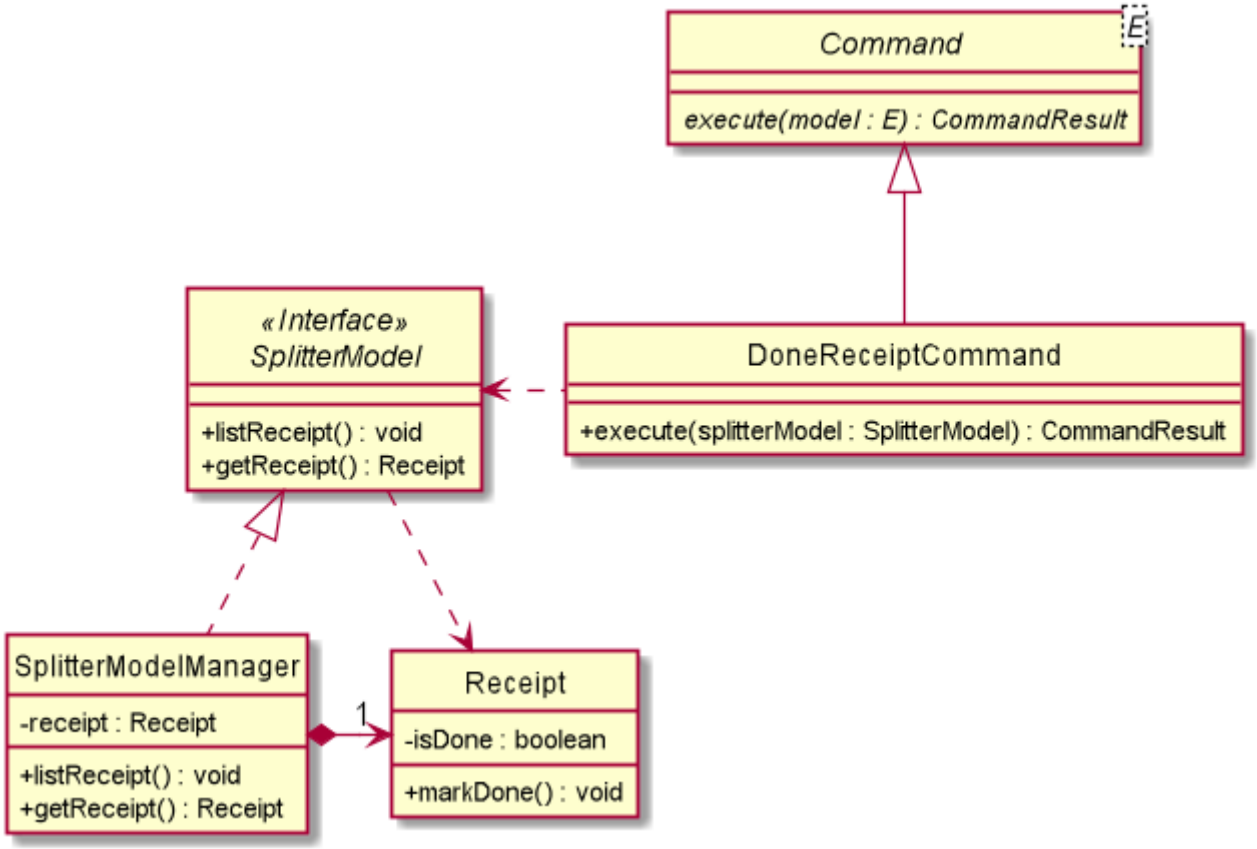


Figure 58. Done Receipt Command Class Diagram

The above class diagram shows the structure of the `DoneReceiptCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `DoneReceiptCommand`.

Implementation of Done Receipt Command

The following is a detailed explanation of the operations `DoneReceiptCommand` performs.

1. The `DoneReceiptCommand#execute(SplitterModel splitterModel)` method is executed.
2. The `SplitterModel#getReceipt()` method is executed and get the current `Receipt`.
3. Then `Receipt#markDone()` method is called.
4. This will invoke the boolean `Receipt#isDone` variable changed to true.

Sequence Diagram for Done Receipt Command

The following sequence diagram summarizes what happens during the execution of `donereceipt` command.

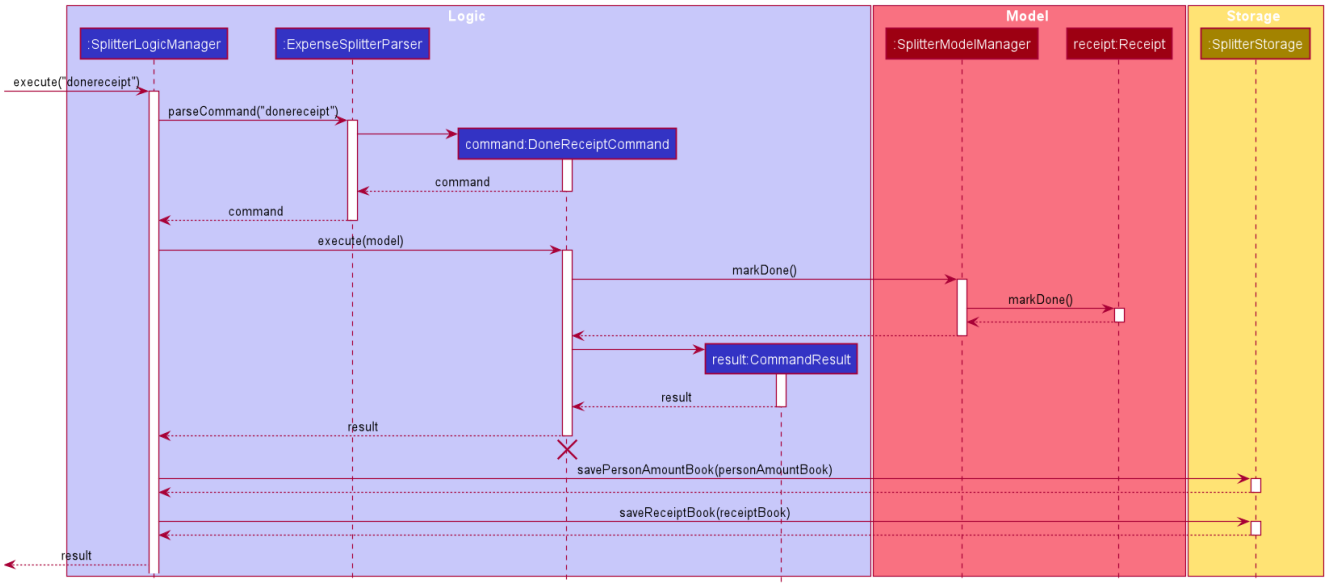


Figure 59. Done Receipt Command Sequence Diagram

4.2.6. Paid Command

In this section, we will learn more about how the `paid` command is implemented.

What is the Paid Command

The `paid` command allows user to reduce the amount of money owed by a Person after they have paid.

The `paid` command was implemented as a `PaidCommand` in the `expensesplitter/logic` package.

The `paid` command has the following input format:

`paid INDEX [AMOUNT]`

NOTE

- `INDEX` is a **compulsory** field. Instead of typing a Person's name, the user can type their index. To find out his/her index, use the command `listamount`.
- `AMOUNT` is an **optional** field. It refers to the amount paid by that Person. Leaving this field empty is equivalent to the Person paying the user the full amount he/she owes the user.
- `AMOUNT` can be up to 2 decimal places, i.e. 7.99. There is no need to add the dollar sign ($).

The following activity diagram illustrates what happens when a user executes `paid` command:

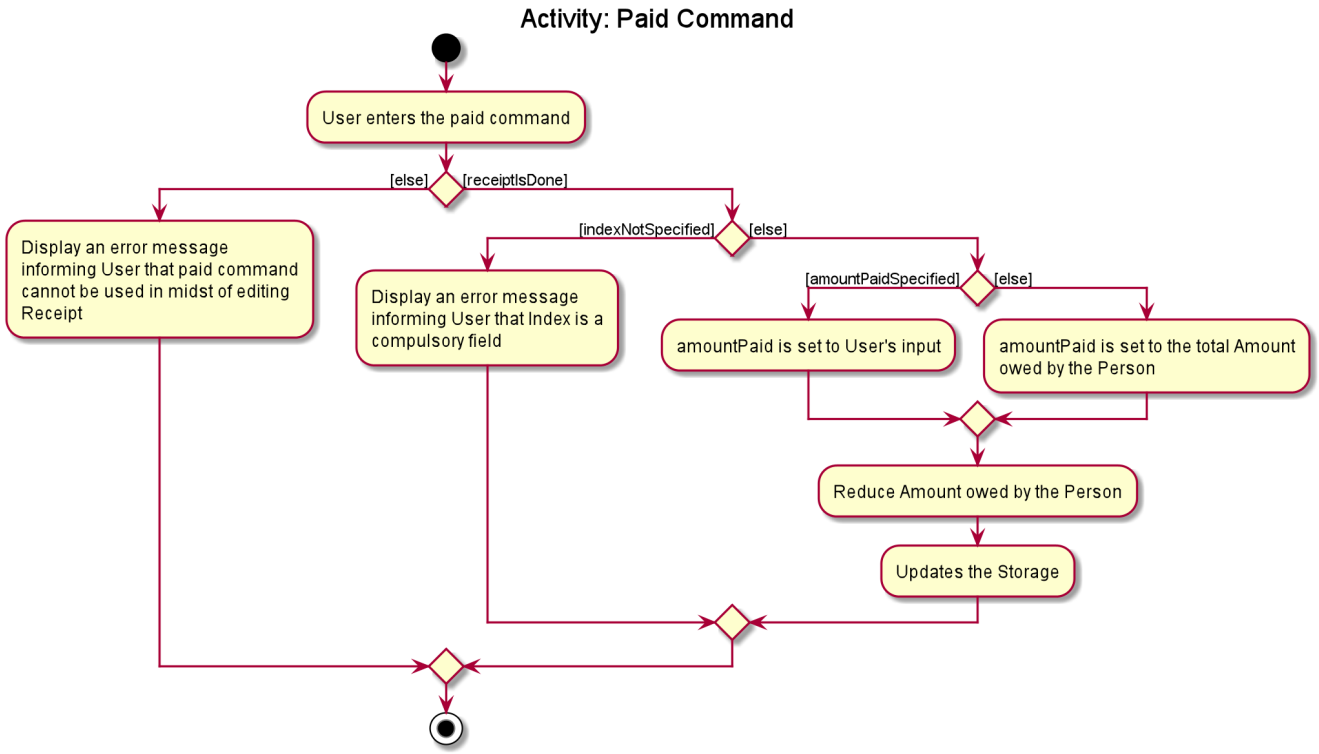


Figure 60. Paid Command Activity Diagram

Structure of Paid Command

In this section, you will learn more about the relationships between objects related to the `PaidCommand`.

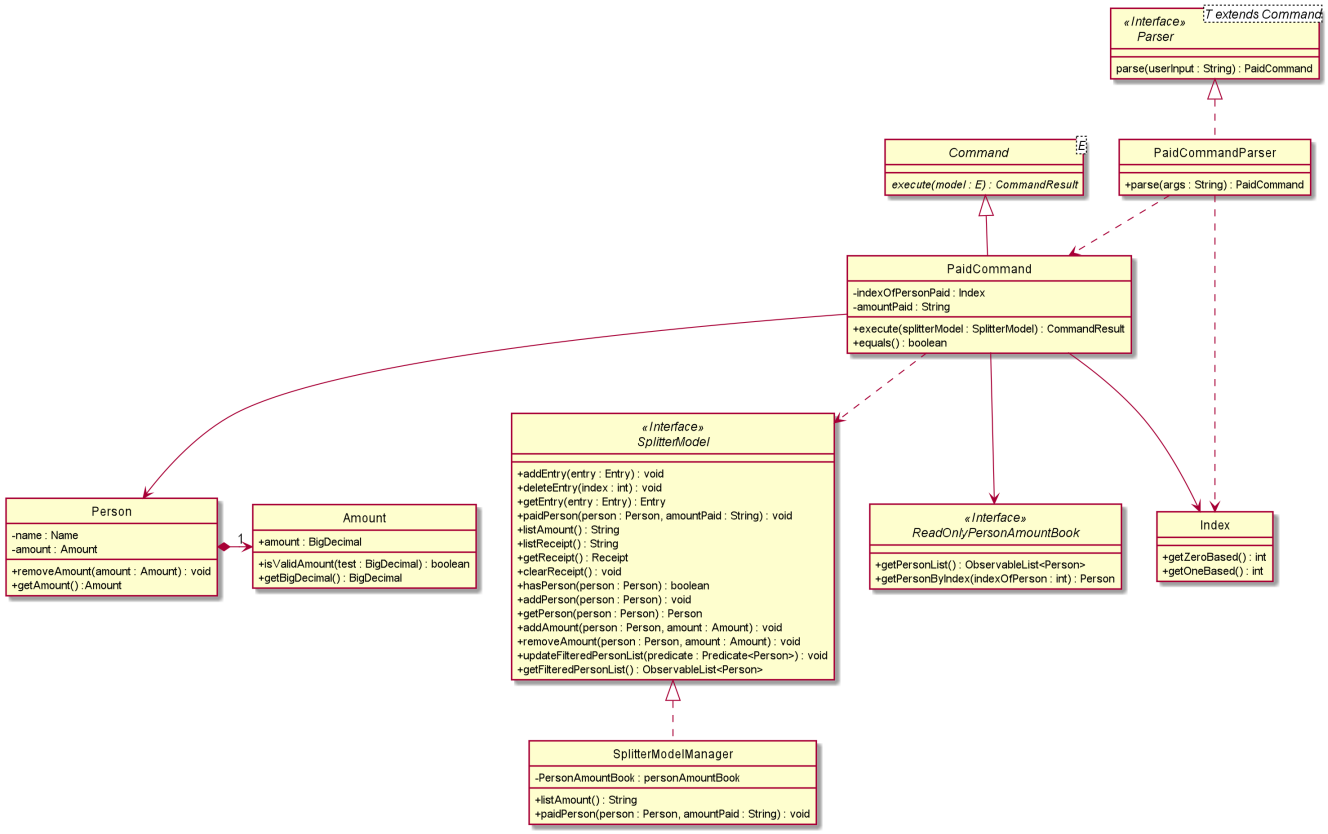


Figure 61. Paid Command Class Diagram

The above class diagram shows the structure of the `PaidCommand` and its associated classes and interfaces. Some methods and fields are left out because they are not of concern in `PaidCommand`

Implementation of Paid Command

The following is a detailed explanation of the operations PaidCommand performs.

1. The `PaidCommand#execute(SplitterModel splitterModel)` method is executed.
2. The `SplitterModel#paidPerson(Person person, String amountPaid)` will be called. String amountPaid will be converted into an Amount by instantiating a new instance of Amount.
3. The `PersonAmountBook#removeAmount(Person person, Amount amount)` is then called to remove Amount from Person.
4. This in turns calls `UniquePersonList#removeAmount(Person person, Amount amount)`.
5. Lastly, `Person#removeAmount(Amount amount)` is called to subtract the amount from the person.

Sequence Diagram for Paid Command

The following sequence diagram summarizes what happens during the execution of `paid` command.

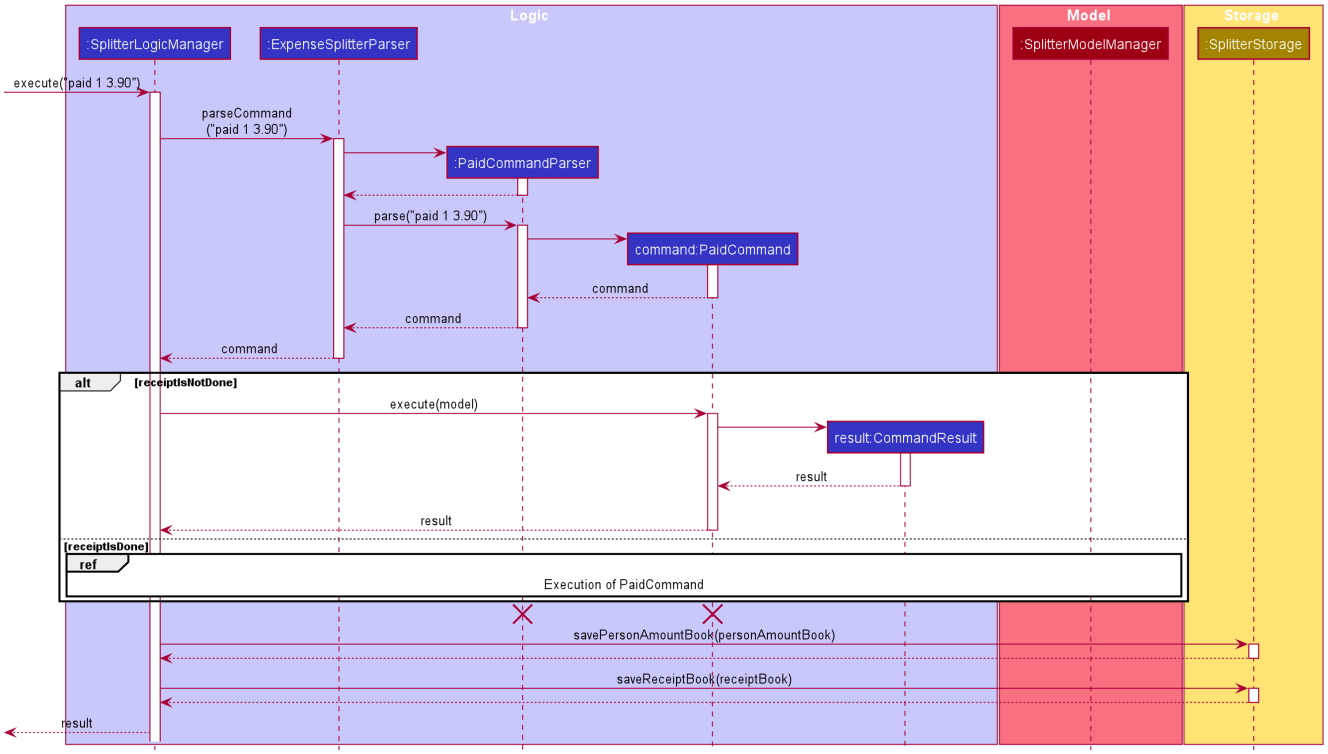


Figure 62. Paid Command Sequence Diagram

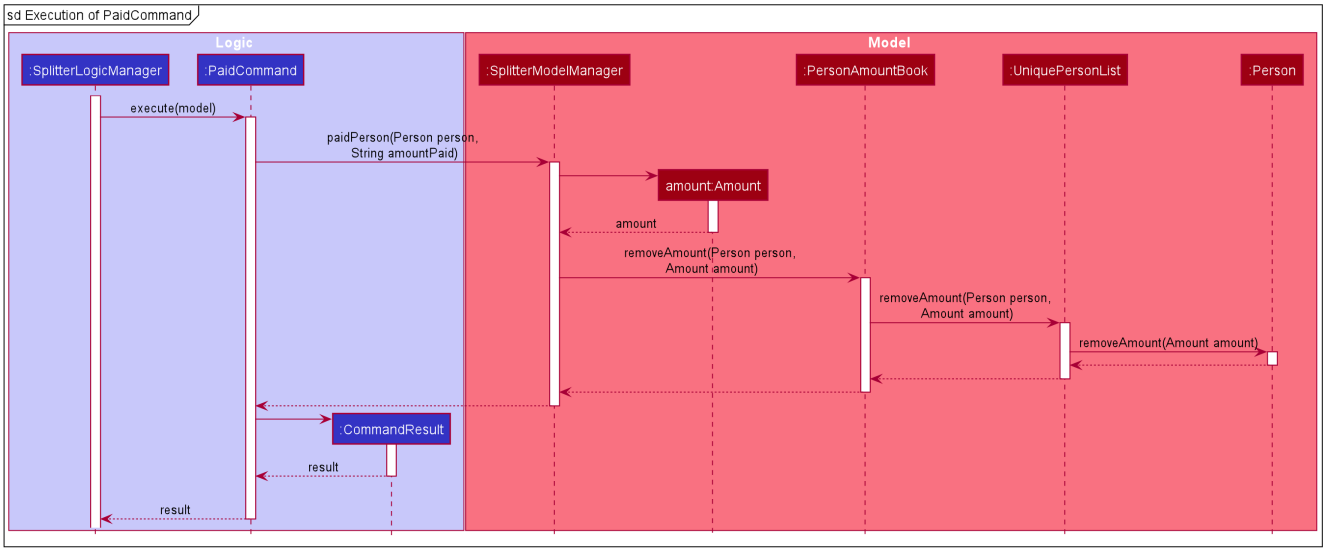


Figure 63. Execution of Paid Command Sequence Diagram

4.2.7. Clear Receipt Command

In this section, we will learn more about how the `clearreceipt` command is implemented.

What is the Clear Receipt Command

The `clearreceipt` command essentially deletes all the Entries in the Receipt and allows the user to input new Entries into a clean receipt.

The `clearreceipt` command was implemented as `ClearReceiptCommand` in the `expensesplitter/logic/commands` package.

The `clearreceipt` command has the following input format:

`clearreceipt`

NOTE

- Use this command only when you are very sure that you want to delete all entries and start a clean receipt.
- When you use the `clearreceipt` command, you are concurrently marking the new receipt as undone. As such, you would only be able to use the `additem` and `deleteitem` commands.

The following activity diagram illustrates what happens when a user executes the `clearreceipt` command:

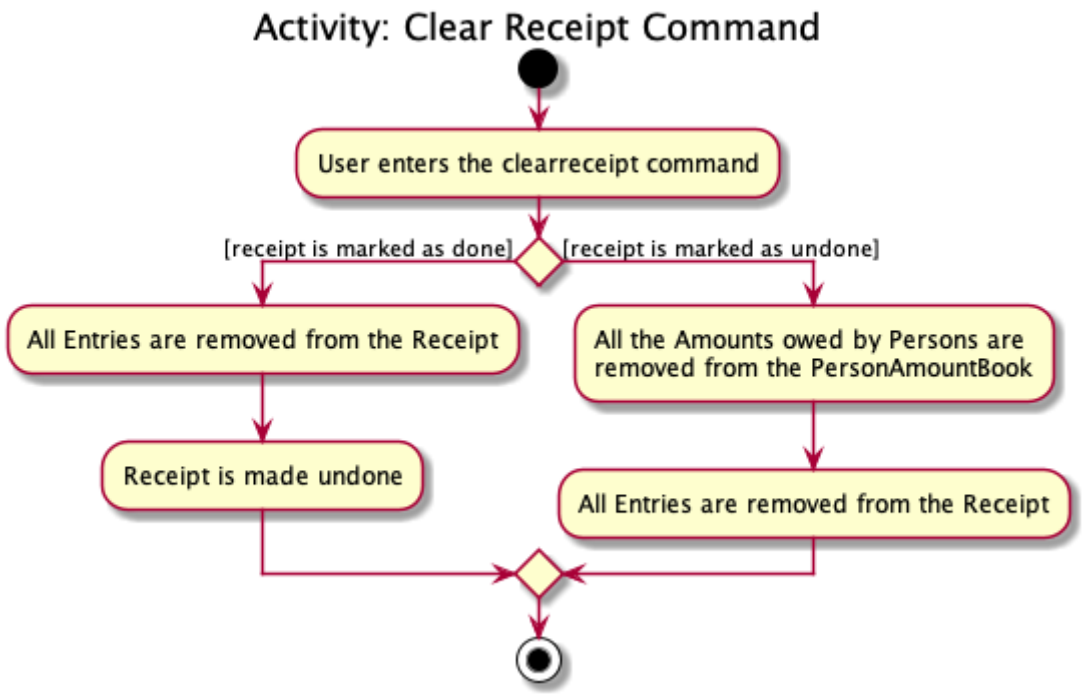


Figure 64. Clear Receipt Command Activity Diagram

Structure of Clear Receipt Command

In this section, you will learn more about the relationships between objects related to the `ClearReceiptCommand`.

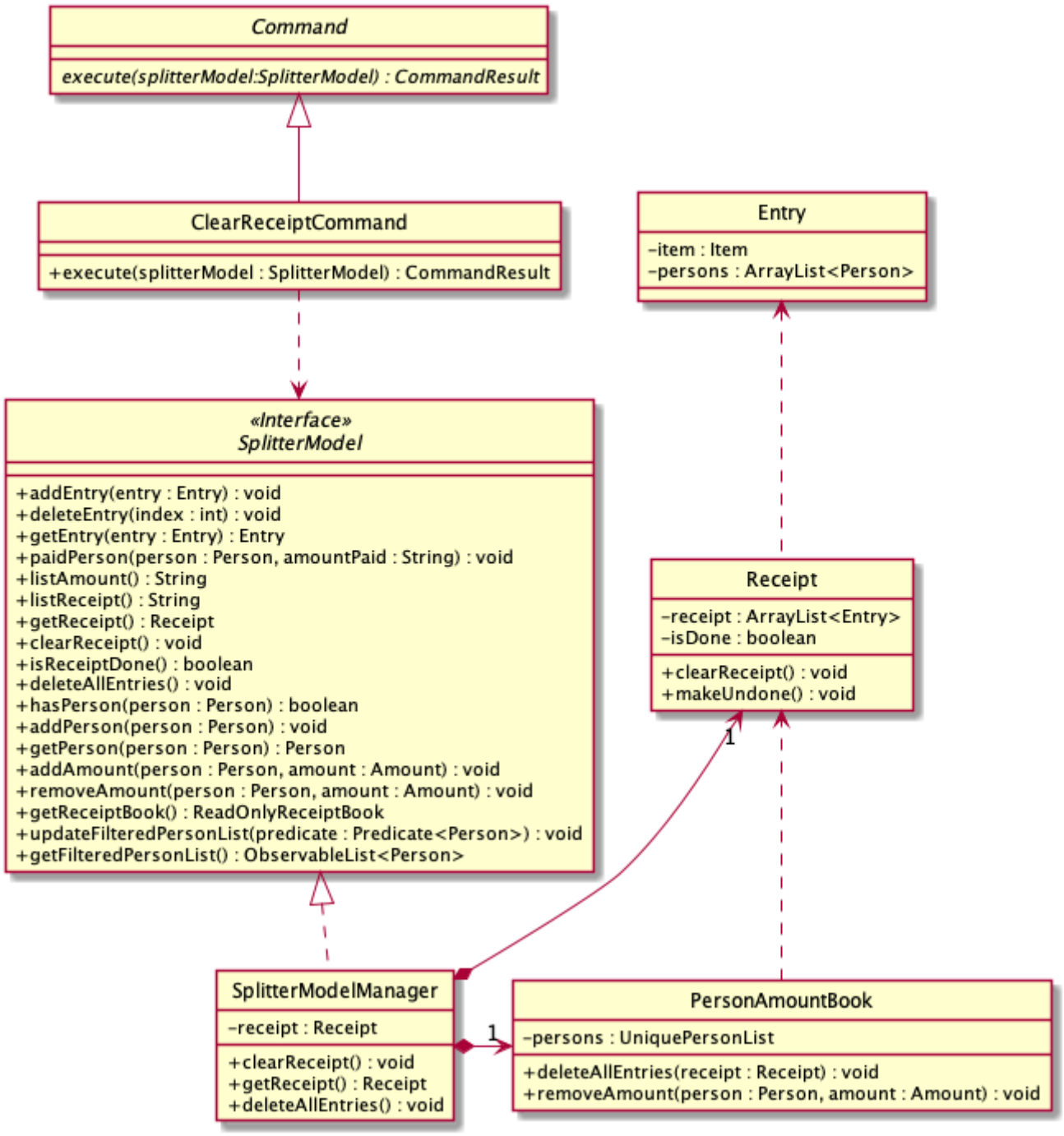


Figure 65. Clear Receipt Command Class Diagram

The above class diagram shows the structure of the `ClearReceiptCommand` and it's associated classes and interfaces. Some methods and fields have been left out because they are not of concern in the `ClearReceiptCommand`.

Implementation of Clear Receipt Command

The following is a detailed explanation of the operations `ClearReceiptCommand` performs.

1. The `ClearReceiptCommand#execute(SplitterModel splitterModel)` method is executed.
2. If the Receipt is marked as undone via the `SplitterModel#isReceiptDone()` method, the `SplitterModel#deleteAllEntires()` method is called, which calls the `PersonAmountBook#deleteAllEntries()` method. What does method does is that it first retrieves the ArrayList<Entry> from the Receipt via the `Receipt#getReceipt()` method, then for each Entry,

it gets the Item and the Amount owed my each person via the `Entry#getItem()` and `Item#getAmountPerPerson()` methods respectively. The Amount is then removed from each Person in the Entry via the `Entry#getPersonsList()` method. After which, the `splitterModel#clearReceipt()` method will then be called. This will invoke the `Receipt#clearReceipt()` method which creates a new ArrayList and assigns it to the Receipt. At the same time, the boolean `Receipt#isDone` is assigned to `false`.

3. If the Receipt is marked as done, the `splitterModel#clearReceipt()` method will then be called. This will invoke the `Receipt#clearReceipt()` method which creates a new ArrayList and assigns it to the Receipt. At the same time, the boolean `Receipt#isDone` is assigned to `false`.

Sequence Diagram for Clear Receipt Command

The following sequence diagram summarizes what happens during the execution of the `clearreceipt` command.

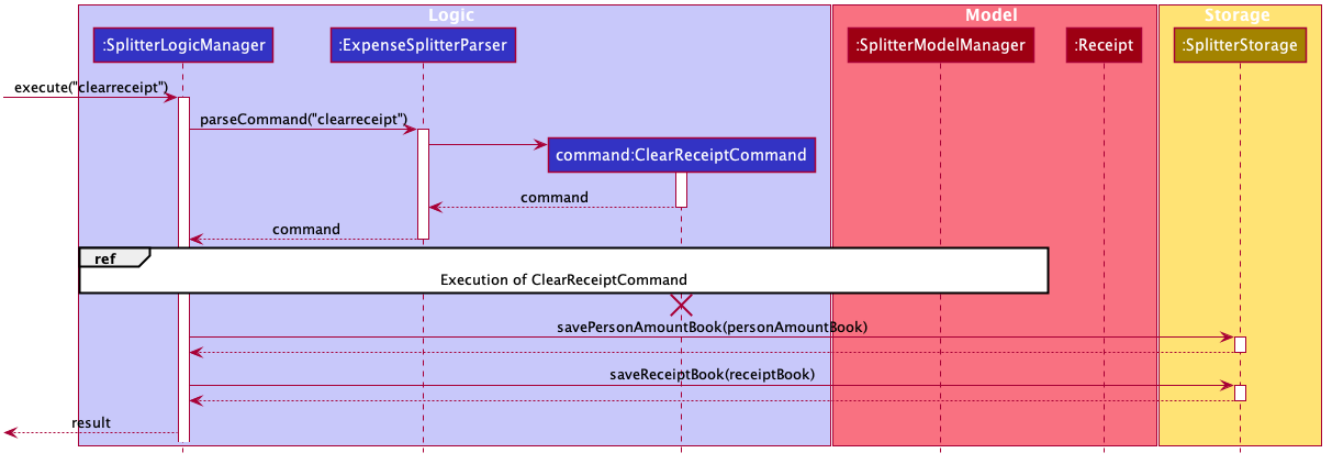


Figure 66. Clear Receipt Command Sequence Diagram

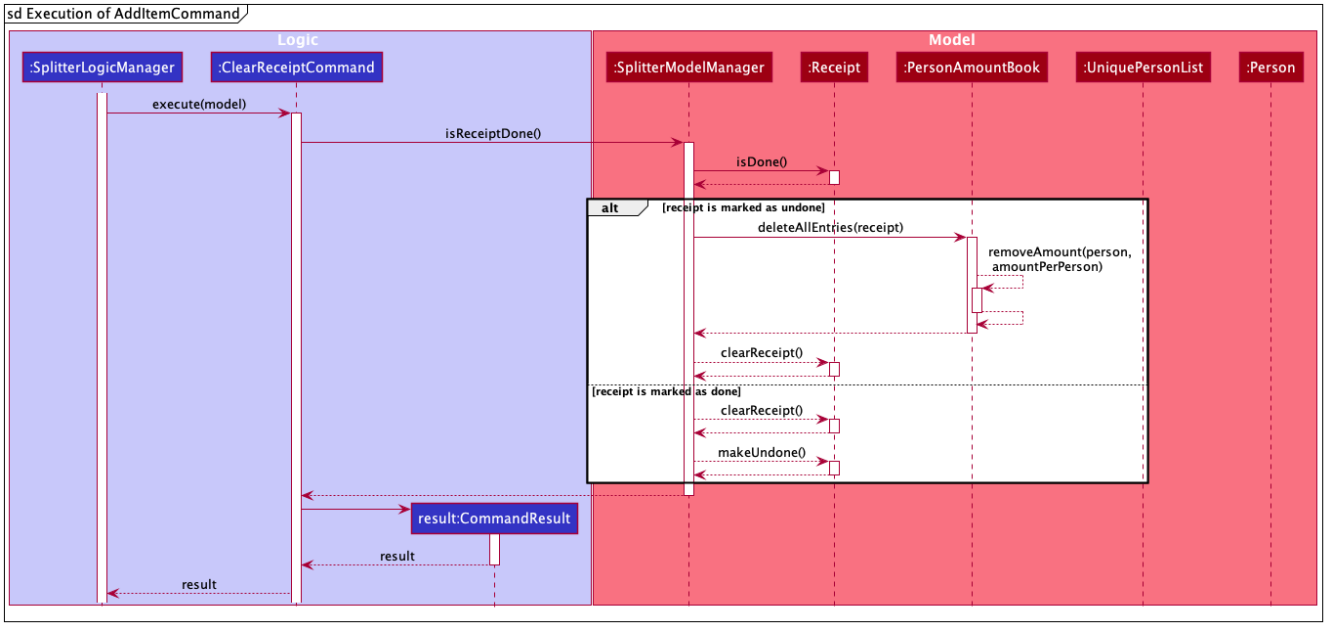


Figure 67. Execution of Clear Receipt Command

4.3. Logging

We are using `java.util.logging` package for logging. The `LogsCenter` class is used to manage the logging levels and logging destinations.

- The logging level can be controlled using the `logLevel` setting in the configuration file (See Section 4.4, “Configuration”)
- The `Logger` for a class can be obtained using `LogsCenter.getLogger(Class)` which will log messages according to the specified logging level
- Currently log messages are output to a `.log` file.

Logging Levels

- `SEVERE` : Critical problem detected which may possibly cause the termination of the application
- `WARNING` : Can continue, but with caution
- `INFO` : Information showing the noteworthy actions by the App
- `FINE` : Details that is not usually noteworthy but may be useful in debugging e.g. print the actual list instead of just its size

4.4. Configuration

Certain properties of the application can be controlled (e.g user prefs file location, logging level) through the configuration file (default: `config.json`).

5. Documentation

Refer to the guide here.

6. Testing

Refer to the guide here.

7. Dev Ops

Refer to the guide here.

Appendix A: Product Scope

Target user profile:

- Temasek Hall residents
- Diet-conscious residents
- Residents who frequently pays on behalf of a group

- Residents who prefer desktop applications
- Residents who can type fast
- Residents who prefer typing over using the mouse
- Residents who are reasonably comfortable using CLI applications

Value proposition: manage diet and expenses faster than a typical mouse/GUI driven app

Appendix B: User Stories

Priorities: High (must have) - * * *, Medium (nice to have) - * *, Low (unlikely to have) - *

Priority	As a …	I want to …	So that I can…
* * *	Temasek Hall resident	want to keep track of my expenses accurately	calculate the exact amount I should collect from my friends after each time we split a meal
* * *	healthy hall resident who is trying to lose weight	check how many calories I took today	keep track of my calories intake and weight
* * *	Temasek hall resident who frequents supper food spots	split the bill easily with fellow mates	ensure that the amount is correctly accounted for
* * *	Temasek Hall resident who wants to stay healthy	keep track of my calories	more accurately watch my weight
*	Temasek Hall leader	keep track of my committee events	know if things are going according to schedule

Priority	As a …	I want to …	So that I can…
*	Temasek Hall exchange student	have a translation for Singaporean lingo	better understand the language my friends speak in hall
*	Temasek Hall sports captain	keep track of the various attendances for my training	know who usually attends training and who does not
*	Temasek Hall leader	keep track of my committee events	ensure things run smoothly
*	Temasek Hall resident who actively participates in hall events	check the upcoming events	keep myself up-to-date
*	Temasek Hall leader	keep track of when my meetings are	ensure I do not keep my teammates or committee member waiting
*	forgetful Temasek Hall resident	keep track of the myriad of hall activities	attend all the fun and exciting events at hall
*	organised resident of Teamsek Hall	remind myself for the tasks i have	meet all deadlines
*	main person in-charge of fixing faults in Temasek Hall	keep track of all different faults that have been reported	fix is as soon as possible to reduce the disruptions to my fellow hall mates

Priority	As a …	I want to …	So that I can…
*	international student who is new to Singapore's culture	keep track of upcoming hall events	join all the fun activities in hall
*	hardworking Temasek Hall resident who wants to manage his schedule	to check module prerequisites	plan my modules
*	attentive resident who notices that the gym has many users	log the entry of users	track the entry and exit timings of all gym users
*	food-loving Temasek Hall resident who frequently uses Grab Food	keep track of my expenses	calculate my savings every month
*	Temasek Hall resident who has many hall friends	keep track of my friends's particulars, especially their room number	find them easily in case I need help
*	Temasek Hall resident who has to pay hall fees	record down my school payments	inform my parents about the necessary expenditures in school
*	swimming captain of Temasek Hall	plan my training sets	better prepare my team for the upcoming competition

Priority	As a …	I want to …	So that I can…
*	Temasek hall exchange student	have a translation for Singaporean lingo	better understand the language my friends speak in hall
*	Temasek Hall Block Head who wants to remember all my block residents	keep a list of all residents and their particulars	contact their next of kin in the case of an emergency

Appendix C: Use Cases

(For all use cases below, the **System** is the `EYLAH` and the **Actor** is the `user`, unless specified otherwise)

Diet Tracker Use Cases

Use case: UC01 Update User Profile

MSS

1. User chooses dieting mode (i.e. Weight Loss, Weight Gain, Maintain)
2. EYLAH updates users' dieting mode
3. User updates height
4. EYLAH updates height of user
5. User updates weight
6. EYLAH updates weight of user

   Use case ends.

Extensions

1a. The flag field for dieting mode is empty or flag is invalid.

- 1a1. EYLAH requests user to re-enter command with flag
- 1a2. User enters command with flag
  Steps 1a1-1a2 are repeated until the correct entered is correct.
  Use case resumes from step 2.

3a. Height field is empty or in invalid format.

- 3a1. EYLAH requests user to re-enter height in correct format

- 3a2. User enters command with height in correct format
  Steps 3a1-3a2 are repeated until the correct entered is correct.
  Use case resumes from step 4.

3b. Height value is too large and beyond the limit.

- 3b1. EYLAH tells user the limit for the height value and prompts to re-enter command.
- 3b2. User will input values within the specified range.
  Steps 3b1-3b2 are repeated until the command entered is correct.
  Use case resumes from step 4.

5a. Weight field is empty or in invalid format.

- 5a1. EYLAH requests user to re-enter weight in correct format
- 5a2. User enters command with weight in correct format
  Steps 5a1-5a2 are repeated until the correct entered is correct.
  Use case resumes from step 6.

5b. Weight value is too large and beyond the limit.

- 5b1. EYLAH tells user the limit for the weight value and prompts to re-enter command.
- 5b2. User will input values within the specified range.
  Steps 5b1-5b2 are repeated until the command entered is correct.
  Use case resumes from step 6.

*a. At any time, User chooses to not proceed after inputting in invalid command.

- *a1. EYLAH will not make any changes
  Use case ends.

Use case: UC02 Add Food Item

MSS

1. User adds food item
2. EYLAH adds food item to user’s log

   Use case ends.

Extensions

1a. The food item is added in an invalid format or certain fields are missing.

- 1a1. EYLAH requests user to re-enter food item in valid format.
- 1a2. User enters command in the correct format as requested by EYLAH
  Steps 1a1-1a2 are repeated until the correct entered is correct.
  Use case resumes from step 2.

*a. At any time, User chooses to not proceed after inputting in invalid command.

- *a1. EYLAH will not make any changes
  Use case ends.

Use case: UC03 Delete Food Item

MSS

1. User lists out existing items
2. EYLAH shows the list based on flags entered
3. User deletes item by index
4. EYLAH deletes item tagged to specified index

   Use case ends.

Extensions

1a. List command contains invalid flag.

- 1a1. EYLAH will show proper usage of the command and the valid flags.
- 1a2. User will re-enter the command with a valid flag.
  Steps 1a1-1a2 are repeated until the command entered is correct. Use case resumes from step 2.

3a. Invalid or empty index keyed into command.

- 3a1. EYLAH requests user to re-enter index in correct format
- 3a2. User enters edit in correct format
  Steps 3a1-3a2 are repeated until the command entered is correct.
  Use case ends. Use case resumes from step 4.

*a. At any time, User chooses to not proceed after inputting in invalid command.

- *a1. EYLAH will not make any changes
  Use case ends.

Use case: UC04 Edit Food Item

MSS

1. User lists out existing items
2. EYLAH shows the list based on flags entered
3. User edits item by index
4. EYLAH edits the data of the item stored at the index.

   Use case ends.

Extensions

1a. List command contains invalid flag.

- 1a1. EYLAH will show proper usage of the command and the valid flags.
- 1a2. User will re-enter the command with a valid flag.

Steps 1a1-1a2 are repeated until the command entered is correct. Use case resumes from step 2.

3a. Invalid or empty index keyed into command.

- 3a1. EYLAH requests user to re-enter index in correct format
- 3a2. User enters edit in correct format
  Steps 3a1-3a2 are repeated until the command entered is correct.
  Use case resumes from step 4.

3b. No additional tags and data keyed in as flags to replace existing data.

- 3b1. EYLAH requests user to re-enter command with at least one flag
- 3b2. User enters command with flag and data
  Steps 3b1-3b2 are repeated until the command entered is correct.
  Use case resumes from step 4.

*a. At any time, User chooses to not proceed after inputting in invalid command.

- *a1. EYLAH will not make any changes
  Use case ends.

Use case: UC05 List Food Items

MSS

1. User lists out existing items
2. EYLAH shows the list based on flags entered

   Use case ends.

Extensions

1a. Invalid flag or additional arguments are entered into the command.

- 1a1. EYLAH will show proper usage of the command and the valid flags.
- 1a2. User will re-enter the command with a valid flag.
  Steps 1a1-1a2 are repeated until the command entered is correct. Use case resumes from step 2.

*a. At any time, User chooses to not proceed after inputting in invalid command.

- *a1. EYLAH will not make any changes
  Use case ends.

Use case: UC06 Track Daily Calories

MSS

1. User calls `list` command
2. EYLAH shows food intake for the day, calories intake for the day, and calories left to consume

   Use case ends.

Extensions

1a. Additional valid flags entered with the list command.

- 1a1. EYLAH would generate and display the appropriate list according to the flag
  User case ends.

*a. At any time, User chooses to not proceed after inputting in invalid command.

- *a1. EYLAH will not make any changes
  Use case ends.

Use case: UC07 Calculate BMI

MSS

1. User calls `bmi` command, with optional height and weight entered
2. EYLAH calculates and shows user's BMI based on the height and weight

   Use case ends.

Extensions

1a. BMI command contains invalid flags.

- 1a1. EYLAH suggests to user the correct format to use
- 1a2. User will key in the correct format
  Steps 1a1-1a2 are repeated until the command entered is correct.
  Use case resumes from step 2.

1b. Both height and weight are not provided as input and there is no stored height and weight.

- 1b1. EYLAH tells user to provide both height and weight as there are no stored values
- 1b2. User will input both height and weight values.
  Steps 1b1-1b2 are repeated until the command entered is correct.
  Use case resumes from step 2.

1c. Height is not provided as input and there is no stored height.

- 1c1. EYLAH tells user to provide height as there are no stored value.
- 1c2. User will input height value with the bmi command.
  Steps 1c1-1c2 are repeated until the command entered is correct.
  Use case resumes from step 2.

1d. Weight is not provided as input and there is no stored weight.

- 1d1. EYLAH tells user to provide weight as there are no stored value.
- 1d2. User will input Weight value with the bmi command.
  Steps 1d1-1d2 are repeated until the command entered is correct.
  Use case resumes from step 2.

1e. Height and weight values are extremely large and beyond the limit.

- 1e1. EYLAH tells user the limit for the values and prompts to re-enter command.

- 1e2. User will input values within the specified range.
  Steps 1e1-1e2 are repeated until the command entered is correct.
  Use case resumes from step 2.

*a. At any time, User chooses to not proceed after inputting in invalid command.

- *a1. EYLAH will not make any changes
  Use case ends.

Expense Splitter Use Cases

Use case: UC08 - Adding an Item

Actor: User
Guarantees:
Item will be added into the Receipt.

MSS

1. User keys in the ItemName, it's ItemPrice and Person(s) involved in the splitting of the Item.
2. EYLAH adds the Item and Persons into a Entry.
3. EYLAH adds the Entry into a Receipt.
4. EYLAH displays the Item and Person(s) involved in the splitting of the item, as well as the Amount owed per Person.

   Use case ends.

Extensions

1a. EYLAH detects empty ItemName, ItemPrice or Person(s)

- 1a1. EYLAH displays an error message and displays an example of a correct `additem` function.

  Use case ends.

1b. Eylah detects invalid syntax.

1b1. EYLAH displays an error message and displays an example of a correct `additem` function.

Use case ends.

Use case: UC09 - Deleting an Item

Actor: User
Preconditions: Item user wants to delete is present in the Receipt.
Guarantees:
Item will be deleted from Receipt.

MSS

1. User keys in request to delete an Item in the current Receipt via it's Index.
2. EYLAH deletes that Item and deducts the appropriate amount associated with each Person(s) involved in splitting that Item.
3. EYLAH displays a MESSAGE_SUCCESS informing the user that Item has been successfully deleted.

   Use case ends.

Extensions

- 1a. User did not input the Index of the Item. (Inserting `deleteitem` instead of `deleteitem 1`)
  - 1a1. EYLAH displays an error message and displays an example of a correct `deleteitem` function.

    Use case ends.

Use case: UC10 - Listing Receipt

Actor: User
Guarantees: All Items in the current Receipt will be listed out.

MSS

1. User requests to list receipt containing Item(s) in the current Receipt.
2. EYLAH displays the list of Item(s) in the current Receipt, its ItemPrice and Person(s) involved in splitting that Item.

   Use case ends.

Extensions

1a. EYLAH detects an empty Receipt.

1a1. EYLAH displays an error message, saying that the Receipt has 0 Item.

Use case ends.

Use case: UC11 - Listing Person(s) and the Amount they owe

Actor: User
Guarantees: All Person(s) and the amount they owe will be listed.

MSS

1. User requests to list all the Person(s) and the Amount they owe the user.
2. EYLAH displays the list of Person(s) and the associated Amount they owe they user.

   Use case ends.

Extensions

1a. EYLAH detects an empty Person list.

   1a1. EYLAH displays an error message, informing user that there are no Person in the list.

   Use case ends.

Use case: UC12 - Paying money

Actor: User
Guarantees: Reduces the Amount a Person owes and if they owe $0 the Person is automatically deleted.

MSS

1. User requests to reduce the Person's Amount when he/she has paid the user.
2. EYLAH searches for the Person and reduces the Amount they owe the user, if after paying the Person does not owe anything, they are deleted.
3. EYLAH then displays the new Amount owed by the Person.

   Use case ends.

Extensions

1a. EYLAH detects that the Person has paid more than what he owes.

   1a1. EYLAH displays an error message, informing the user to key in an Amount lesser or equal to the amount the Person owes.

   Use case ends.

2a. EYLAH detects an empty PersonList.

   2a1. EYLAH displays an error message, saying that there is no Person in the list.

   Use case ends.

2b. EYLAH detects invalid IndexOfPersonPaid.

   2b1. EYLAH displays an error message and informs User to key in the correct Index of the person who paid. EYLAH will prompt the user to use `listamount` to find the Index of Person who paid.

   Use case ends.

2c. EYLAH detects that the Person does not exist in the list.

2c1. EYLAH displays an error message, informing the user to key in the correct index of the Person. EYLAH will prompt the user to use `listamount` to find the Index of Person who paid.

Use case ends.

Use case: UC13 - Clearing the Receipt when Receipt is done

Actor: User
Preconditions: Receipt is marked as done.
Guarantees:
Deletes all the Entries in the Receipt. It also marks the Receipt as undone.

MSS

1. User requests to clear the receipt after he/she decides to start a clean Receipt.
2. EYLAH removes all the Entries from the Receipt.
3. EYLAH marks the Receipt as undone.
4. EYLAH display a MESSAGE_SUCCESS informing the user that the Receipt has been successfully cleared.

Use case ends.

C.1. Use case: UC14 - Clearing the Receipt when Receipt is undone

Actor: User
Preconditions: Receipt is marked as undone.
Guarantees:
Deletes all the Entries in the Receipt. It also marks the Receipt as undone.

MSS

1. User requests to clear the receipt after he/she decides to start a clean Receipt.
2. EYLAH removes Amount owed per Person from the PersonAmountBook.
3. EYLAH removes all the Entries from the Receipt.
4. EYLAH display a MESSAGE_SUCCESS informing the user that the Receipt has been successfully cleared.

Use case ends.

Use case: UC15 - Back to Main Menu

MSS

1. User requests to exit Expense Splitter and go back to Main Menu of EYLAH.
2. EYLAH exits Expense Splitter and goes back to Main Menu

   Use case ends.

Extensions

Use case: UC16 - Completing the receipt

Actor: User
Guarantees:
Displays the confirmation message to user. It also marks the Receipt as done.

MSS

1. User requests to mark the Receipt as done after he/she finish adding the items.
2. EYLAH marks the current Receipt as done.
3. EYLAH display a MESSAGE_SUCCESS informing the user that the Receipt has been marked as completed.

   Use case ends.

Extensions

2a. EYLAH detects that the Receipt has already been marked as done.

2a1. EYLAH displays an error message, informing the user that current Receipt already been marked as completed.

Use case ends.

Appendix D: Non Functional Requirements

1. Should work on any mainstream OS as long as it has `Java 11` or above installed.
2. Should be able to hold up to 1000 persons without a noticeable sluggishness in performance for typical usage.
3. Should be able to hold up to 1000 food items without a noticeable sluggishness in performance for typical usage.
4. Should have a pre-loaded list of commonly consumed food items in database.
5. Should be able to work without internet access.
6. A user should be able to use EYLAH easily and intuitively.
7. A user with above average typing speed for regular English text (i.e. not code, not system admin commands) should be able to accomplish most of the tasks faster using commands than using

the mouse.

8. An Item should not have a Item Price more than $10,000.

Appendix E: Glossary

Temasek Hall

A Hall of Residences in National University of Singapore

CLI

Command Line Interface

Syntax

The structure of statements in the command

Mainstream OS

Windows, Linux, Unix, OS-X

Private contact detail

A contact detail that is not meant to be shared with others

Body-Mass Index (BMI)

The BMI is a convenient rule of thumb used to broadly categorize a person as underweight, normal weight, overweight, or obese based on tissue mass (muscle, fat, and bone) and height

Table 1. Diet Tracker Command Prefix

Prefix	Description	Used in Following Commands
-n	Name of Food	**Add**, **Edit**
-c	Calories	**Add**, **Edit**
-i	Index	**Edit**
-g	Gain	**Mode**
-m	Maintain	**Mode**
-f	Foods	**List**
-d	Day	**List**
-t	Track	**List**
-h	Height	**Bmi**
-w	Weight	**Bmi**

Table 2. Expense Splitter Command Prefix

Prefix	Description	Used in Following Commands

-i	Item Name	**Add Item**
-p	Item Price	**Add Item**
-n	Name of Person	**Add Item**

Appendix F: Product Survey

My Fitness Pal

Pros:

- Customizable according to the User's demands.
- Able to monitor the User's exercise and movement.

Cons:

- Application was hacked and data was leaked.
- Unable to use it offline.

Splitwise

Pros:

- Very user friendly.
- Easy track of expenses.

Cons:

- Has a tendency of complicating splitting bills.
- Unable to use it offline.

Appendix G: Instructions for Manual Testing

Given below are instructions to test the app manually.

NOTE	These instructions only provide a starting point for testers to work on; testers are expected to do more *exploratory* testing.

G.1. Launch and Shutdown

1. Initial launch
   a. Download the jar file and copy into an empty folder
   b. Navigate to that folder using Terminal and type `java -jar EYLAH.jar`
   Expected: Shows the CLI interface with welcome message. The window size may not be optimum.

G.2. Adding a Food in Diet Tracker

1. Adding a Food

    a. Test case: `add -n burger -c 170`
    Expected: Food is added to FoodBook. Details of the added Food are shown in the status message. Timestamp in the status bar is updated.

    b. Test case: `add burger`
    Expected: No Food is added. Error details and the correct format to input will be shown to the user.

    c. Other incorrect add commands to try: `add`, `add` with no flags `-n` and `-c` appended to the command.
    Expected: Similar to previous.

G.3. Deleting a Food in Diet Tracker

1. Deleting a Food while all Foods are listed

    a. Prerequisites: List all Foods using the `list` command. Multiple Foods in the list.

    b. Test case: `delete 1`
    Expected: First Food is deleted from the list. Details of the deleted Food shown in the status message. Timestamp in the status bar is updated.

    c. Test case: `delete 0`
    Expected: No Food is deleted. Error details shown in the status message. Status bar remains the same.

    d. Other incorrect delete commands to try: `delete`, `delete x` (where x is larger than the list size)
    Expected: Similar to previous.

G.4. Editing a Food in Diet Tracker

1. Editing a Food while all Foods are listed

    a. Edit Command format: `edit -i INDEX [-n NAME] [-c CALORIES]`

    b. Prerequisites: List all Foods using the `list` command. Multiple Foods in the list.

    c. Test case: `edit -i 1 -n Pasta`
    Expected: First Food is edited. Details of the edited Food shown in the status message. Timestamp in the status bar is updated. Food is edited and then restored.

    d. Test case: `edit -i 1`
    Expected: No Food is edited. Error details shown in the status message. Status bar remains the same.

    e. Other incorrect delete commands to try: `edit`, `edit -i x` (where x is larger than the list size)
    Expected: Similar to previous.

G.5. Set Dieting Mode In Diet Tracker

1. Setting a Dieting Mode for Diet Tracker.
    a. Mode Command format: `mode [-l] [-g] [-m]`
    b. Test case: `mode -l`
    Expected: Sets the Dieting Mode for the Diet Tracker and stores it.
    c. Test case: `mode`
    Expected: No Dieting Mode will be set. Error details shown in the response message.

G.6. Check User Metrics In Diet Tracker

1. Checking a Users own health metrics (Height, Weight and Dieting Mode).
    a. Metrics Command format: `metrics`
    b. Test case: `metrics`
    Expected: The User's own metrics will be printed out.
    c. Test case: `metrics -h`
    Expected: No metrics will be shown. Error details shown in the response message.

G.7. Calculate BMI In Diet Tracker

1. Calculating BMI for the User or for others.
    a. Bmi Command format: `bmi [-h HEIGHT] [-w WEIGHT]`
    b. Test case: `bmi -h 170.2 -w 65.7`
    Expected: BMI will be calculated with the Height of 170.2cm and Weight of 65.7kg, and will be printed and shown to the user. The BMI category will also be displayed to the User.
    c. Test case: `bmi -h 170.2`
    Prerequisites: Must have stored Weight using `weight WEIGHT`. Expected: BMI will be calculated with the Height of 170.2cm and the User's stored Weight, and will be printed and shown to the user. The BMI category will also be displayed to the User.
    d. Test case: `bmi -w 65.7`
    Prerequisites: Must have stored Weight using `height HEIGHT`. Expected: BMI will be calculated with the User's stored Height and the Weight of 65.7kg, and will be printed and shown to the user. The BMI category will also be displayed to the User.
    e. Test case: `bmi`
    Prerequisites: Must have stored Height using `height HEIGHT` and Weight using `weight WEIGHT`. Expected: BMI will be calculated with the User's stored Height and Weight, and will be printed and shown to the user. The BMI category will also be displayed to the User.
    f. Test case: `bmi -h 10000000000000000 -w 10000000000000000`
    Expected: Input height and weight are above the acceptable range. Error details shown in the response message.
    g. Other incorrect edit commands to try: `bmi -h -1`, `bmi -h 137` (without storing Weight), `bmi -w 67` (without storing Height)

Expected: BMI will not be calculated. Error Message will be shown with details.

G.8. Store Height In Diet Tracker

1. Storing Height into the Diet Tracker.
    a. Height Command format: `height HEIGHT`
    b. Test case: `height 170.2`
    Expected: Stores a Height of 170.2cm into Diet Tracker. Details of the height stored are shown in success message.
    c. Test case: `height -1`
    Expected: Height will not be stored. Error details shown in the response message.
    d. Other incorrect height commands to try: `height 0`, `height 1000000000000001`
    Expected: Height will not be stored. Expected: Error message shown with details.

G.9. Store Weight In Diet Tracker

1. Storing Weight into the Diet Tracker.
    a. Height Command format: `weight WEIGHT`
    b. Test case: `weight 65.7`
    Expected: Stores a Weight of 65.7kg into Diet Tracker. Details of the weight stored are shown in success message.
    c. Test case: `weight -1`
    Expected: Weight will not be stored. Error details shown in the response message.
    d. Other incorrect weight commands to try: `weight 0`, `weight 1000000000000001`
    Expected: Weight will not be stored. Error message shown with details.

G.10. Add Item In Expense Splitter

1. Adding an Item into the current Receipt.
    a. Add Item Command format: `additem -i ITEMNAME -p ITEMPRICE -n PERSON [-n PERSON]…`
    b. Test case: `additem -i pasta -p 33.50 -n John -n Bob`
    Expected: Adds an item with the above details to current receipt and increase the person amount equal to dividing the price with the number of person splitting that item.
    c. Test case: `Invalid Syntax`
    Expected: No item is added to the current receipt and no change to person amount. An error message will be displayed.

G.11. Delete Item In Expense Splitter

1. Deleting an Item from the current Receipt.
    a. Delete Item Command format: `deleteitem INDEX`

b. Test case: `delete 1`
Expected: Removes the item of the specified index from the receipt.

c. Test case: `Invalid Syntax`
Expected: No item will be deleted from the current receipt. An error message will be displayed.

G.12. List Receipt in Expense Splitter

1. Listing the items contained in the current receipt. The order of items listed depends on the order of items added by the user.

   a. ListReceipt Command format: `listreceipt`

   b. Prerequisites: NIL.

   c. Test case: `listreceipt`
   Expected: If there are items in the receipt: List all items in the current receipt, its price and amount associated with each person involved in splitting that item

   d. Test case: `listreceipt`
   Expected: If there are no items in the receipt: EYLAH will inform user that there is no items currently in the receipt.

G.13. List Amount In Expense Splitter

1. List all the Person(s) and the amount they owe.

   a. List Receipt command format: `listamount`

   b. Test case: `listamount`
   Expected: If there are Person in the list: List all Person that currently owe the User money. There should not be anyone with $0 as those who do not owe any money will be deleted from the PersonList.

   c. Test case: `listamount`
   Expected: If there are no Person in the list: EYLAH will inform user that there no one owes money.

G.14. Done Receipt In Expense Splitter

1. Marks the current receipt as done.

   a. Done Receipt Command format: `donereceipt`

   b. Test case: `donereceipt`
   Expected: The receipt is marked as done. A success message will be displayed.

G.15. Paid Command In Expense Splitter

1. Reduces the amount of money a Person owes.

   a. Paid command format: `paid INDEX [AMOUNT]`

b. Test case: `paid 1 1.10`
   Expected: Reduces the amount of money the Person at Index 1 owes by $1.10.

c. Test case: `paid 1`
   Expected: Reduces the entire amount of money the Person at Index 1 owes.

d. Test case: `paid -1`
   Expected: EYLAH will inform the user that INDEX is incorrect.

G.16. Clear Receipt In Expense Splitter

1. Clears the receipt and marks the receipt as undone.

   a. Clear Receipt Command format: `clearreceipt`

   b. Test case: `clearreceipt`
      Expected: The receipt is cleared and is marked as undone. A success message will be displayed.

G.17. Saving data

1. Manual saving is not required as data is already saved in the hard disk after any commands that changes the data.

Appendix H: Effort

Overview
As residents of Temasek Hall, members of our group frequents the supper area rather often and we have come to realise two problems that we face:
1. Splitting bills with multiple people can be a headache, especially if some of the food items are shared amongst different groups of residents.
2. There was no way of tracking our diet with the numerous suppers that we had.

In order to dive deeper into this problem, our group asked around to see if similar problems were faced by other residents. What we found was that many residents faced the same problems. One of the residents even conducted a survey before. As such, after studying the survey, our team wanted realised that we could make an application to help residents with problems we all face while staying in Temasek Hall.

Hence, we decided to build EYLAH, a super application that has both a diet tracker and a expense splitter functionality. EYLAH is significantly different from Address Book 3 (AB3) in many aspects. We needed to add audience-specific features to satisfy the needs of our target audience-residents staying in Temasek Hall.

Challenges
The team encountered a few issues during the development process of EYLAH. The more notable ones are:

- **Project Ideation**
  At the very beginning of our project, we came up with many different ideas that could

potentially solve the various problems Temasek Hall residents face. After many discussions, we finally boiled it down to 2 ideas. Moving on, we realised that each of us had our own idea of how to implement each feature and we even had some arguments regarding this. However, we sat down and sorted out the uncertainties and clarified with each other what the best approach would be to tackle the implementation of these ideas. At the end of the day, we not only came up with the solution but also the roadmap to our project.

- **Representation of Currency**
  When we first started building our application. We were met with our first roadblock. How should we represent our currency? We knew that using `double` was out of the question as there were issues with it overflowing. Not only that, floating point values cannot be stored exactly in memory. There was also the issue of loss of significance. (Explained here: htts://dzone.com/articles/never-use-float-and-double-for-monetary-calculatio) As such, Willy did a bit of research and discovered that using Java's `BigDecimal` was the way to go. `BigDecimal` does not allow negative values and allows for precision formatting.

- **Deleting an Item after Paid**
  Whenever a user adds an Item, the Amount owed by someone is stored in a PersonAmountBook. When a Item is deleted, the Amount is also removed from the PersonAmountBook. The problem we faced here is when the user decides to use the `paid` command to reduce the Amount owed by someone before using the `deleteitem` command. This meant that the Amount owed by someone might potentially go to negative, which is not allowed by nature of `BigDecimal`. As such, our group decided to include a boolean flag in the Receipt to ensure that the `paid` command can only be used after the Receipt has been marked as completed. Similarly, the `additem` and `deleteitem` commands can only be used if the Receipt is marked as incomplete.

- **Integer Overflow**
  In many of our intra-group bug testing sessions, we would often encounter problems with regards to integer overflow, whereby we would enter an incredibly large number as the price of an Item or the Calories of a Food. This would cause Exceptions to be thrown, causing our application to crash. To fix such problems, we made a cap on the values that can be inputted by the user.

Conclusion

In conclusion, our team had a terrific time working with each another and we hope our application, EYLAH, will indeed help to ease the lives of the residents at Temasek Hall. Overall, we believe that EYLAH is a good testament to our hard work and the time spent on perfecting it.