Neo Weihong - Project Portfolio

PROJECT: SugarMummy

Overview

SugarMummy is a desktop application used to manage a type-II diabetic lifestyle. The user interacts with it using a CLI, and it has a GUI created with JavaFx. It is written in Java and has about 30 kLOC.

Summary of contributions

- **Major enhancement**: added **the ability for the application to provide a personalised user experience for the user.**
  - What it does: Allows the user to:
    1. View, add, edit and clear his / her biography.
    2. Attain different levels of achievements upon meeting predefined requirements.
    3. Customise font and background to *any* hexadecimal-value colour (or image for background).
  - Justification: These features improve the product significantly because a user would want to add a user profile with useful information especially in times of emergency, acquire a sense of achievement at different milestones, and enjoy a substantial degree of flexibility in aesthetic customisation, representing his / her preferences, that enhances his / her overall quality of comfort in using the app.
  - Highlights: These enhancements benefit commands to be added in future since new fields in a user's biography, achievements and aesthetic preferences could be easily defined in further developments via inheritance and polymorphism. Implementation of the `Achievements` sub-feature was particularly challenging as it required careful interaction with other features such as the `Average` feature and `Record` instances, in addition to maintaining balance between abstraction and minimising coupling.
- **Minor enhancements**:
  - Added over 600+ motivational quotes from various sources to be selected at random and shown to the user for each session of the main application's execution.
- **Code contributed**: [View RepoSense]
- **Other contributions**:
  - Project management:
    - Refined release of `v1.3.2` and `v1.3.3` on GitHub.
    - Wrote additional tests for existing features to increase line coverage by 21%. (Pull requests #173, #176, #181)

        - Standardised project structure for `v1.4` release. (Pull request #183)
    - Enhancements to existing features:
        - Abstracted code in MainApp to significantly reduce code redundancies and improve code readability. (Pull request #88)
        - Modified user feedback display to wrap text and scroll vertically for increased ease of viewing feedback. (Pull requests #71, #151)
    - Documentation:
        - Added 90 test situations to the `Instructions for Manual Testing` section part of the Developer Guide. (Pull request #186)
        - Updated `Contact Us` page, `User Stories` and `References` in the Developer Guide. (Pull requests #16, #17, #191)
        - Updated `Readme` and application screenshots. (Pull requests #22, #163, #220)
    - Community:
        - Implemented seamless switching of panes from one feature to another with caching abilities for optimised performance through a helper class with `Supplier` methods for other features' use as well. (Pull request #62)
        - Implemented `StyleSheetManager` to add universal aesthetic support for all features, along with common scrollpanes. (Pull requests #92, #94, #194)

Contributions to the User Guide

*Given below are **samples** of sections I contributed to the User Guide. They showcase my ability to write documentation targeting end-users. The full section of personalised features in the user guide may be accessed here.*

Shows all the achievements that the user has attained: `achvm`

Format: `achvm`

Displays the current list of achievements attained by the user, categorised by record type. Each achievement has a picture that represents it, a title, level, state and requirement required to attain the achievement.

...(Click here for more information on the `achvm` command in the UG.)

Displays the user's biography': `bio`

Format: `bio`

Displays a pane containing user information such as the user's profile picture, name, NRIC, gender, date of birth, contact number, address and other biography information that the user would like to include.

...(Click here for more information on the `bio` command in the UG.)

Adds the user's biography: `addbio`

Format: `addbio n/NAME [dp/DP PATH] [desc/PROFILE DESCRIPTION] [nric/NRIC] [g/GENDER] [dob/DATE OF BIRTH] p/CONTACT NUMBER… e/EMERGENCY CONTACT… m/MEDICAL CONDITION… [a/ADDRESS] [goal/GOAL]… [o/OTHER BIO INFO]`

A user may add a biography if there isn't already an existing one stored in the application. This could occur if the storage file is corrupted (refer to above sub-section on `bio`), or if the user decides to clear the biography (refer to following sub-section on `clrbio` command). A user may add **at most one** biography.

In adding a biography, it is **compulsory** for the user to include the following information (i.e. should not be blank):

- `NAME`
- `CONTACT NUMBER`
- `EMERGENCY CONTACT`
- `MEDICAL CONDITION`

Examples of **VALID** `addbio` commands, provided that a biography does not yet exist, include:

- `addbio dp//Users/bob/Desktop/doge.png desc/hello world n/testName nric/testNric gender/testGender dob/1920-12-21 p/12343567 p/91234567 e/81234567 m/testMedicalCondition a/example address 123 goal/testGoal o/testOtherInfo` (Note: this is provided that the image exists at exactly the **SAME PATH** in the user's device. Otherwise, it has to be modifed or removed in order for this example to work)
- `addbio n/testMinimal p/91234567 e/81234567 m/testMedicalCondition`

…(Click here for more information on the `addbio` command in the UG.)

Edits the user's biography: `editbio`

Format: `editbio [n/NAME] [dp/DP PATH] [desc/PROFILE DESCRIPTION] [nric/NRIC] [g/GENDER] [dob/DATE OF BIRTH] [p/[INDEX/]CONTACT NUMBER]… [e/[INDEX/]EMERGENCY CONTACT]… [m/[INDEX/]MEDICAL CONDITION]… [a/ADDRESS] [goal/[INDEX/]GOAL]… [o/OTHER BIO INFO]`

A biography can be edited only if one already exists. If the user intends to edit the second of three phone numbers in a list, he or she may input `editbio p/2/1234567` to change the second number in the list of phone numbers.

Examples of **VALID** `editbio` commands, provided that a biography exists, include:

- `editbio desc/hello world n/testName nric/testNric gender/testGender dob/1920-10-08 p/91234567 e/81234567 m/testMedicalCondition a/example address 123 goal/testGoal o/testOtherInfo`
- `editbio dob/2019-12-28`

…(Click here for more information on the `editbio` command in the UG.)

Clears the user's biography: `clrbio`

Format: `clrbio`

A user may clear his or her biography using the `clrbio` command. If a biography exists, all data from all biography fields will be removed. Otherwise, if a biography does not exist, the user will be displayed a message that the biography is already empty and there is no biography information to clear.

...(Click here for more information on the `clrbio` command in the UG.)

Sets the font color of the application: `fontcolour` or `fontcolor`

Formats:

- `fontcolour COLOUR [bg/BACKGROUND ARGUMENTS]` or `fontcolor COLOUR [bg/BACKGROUND ARGUMENTS]`; or
- `fontcolour` or `fontcolor`

To set a colour of a font using a colour name, simply enter `fontcolour` (or the American spelling `fontcolor`; both are recognised by the program) followed by the intended name of the colour. For instance, one may enter: `fontcolour yellow` or `fontcolor skyblue`.

A colour may be set using its hexadecimal value provided it follows format beginning with a '#' followed by six valid alphanumeric characters representing a hexadecimal colour. For instance, one may enter: `fontcolour #FFFF00` or `fontcolor #FFFF3A`.

Examples of **VALID** `fontcolour` (or `fontcolor`) commands:

- `fontcolour yellow`
- `fontcolor indigo`
- `fontcolour #202020`

...(Click here for more information on the `fontcolour` command in the UG.)

Sets the background image or colour of the application: `bg`

Formats:

- `bg COLOUR [fontcolour/COLOUR]` or `bg COLOUR [fontcolor/COLOUR]`; or
- `bg PATH [s/BACKGROUND SIZE] [r/BACKGROUND REPEAT] [fontcolour/COLOUR]` or `bg PATH [s/BACKGROUND SIZE] [r/BACKGROUND REPEAT] [fontcolor/COLOUR]`; or
- `bg [s/BACKGROUND SIZE] [r/BACKGROUND REPEAT] [fontcolour/COLOUR]` or `bg [s/BACKGROUND SIZE] [r/BACKGROUND REPEAT] [fontcolor/COLOUR]` (only if background is already a background image); or
- `bg`

Users are allowed to set the background either using a `COLOUR` or a `PATH` to a background image.

The `COLOUR` argument of the background works in exactly the same way as described in the `fontcolour` or (`fontcolor`) sub-section above, except that command word used is now `bg` instead of `fontcolour` (or `fontcolor`). i.e. a user may enter `bg blue` or `bg #202020` to set the background image.

In addition to specifying a `COLOUR`, a user may also specify a `PATH` for background image.

Examples of **VALID** `bg` commands:

- `bg yellow`
- `bg indigo`
- `bg #202020`
- `bg /Users/bob/Desktop/SpaceModified.jpg`

...(Click here for more information on the `bg` command in the UG.)

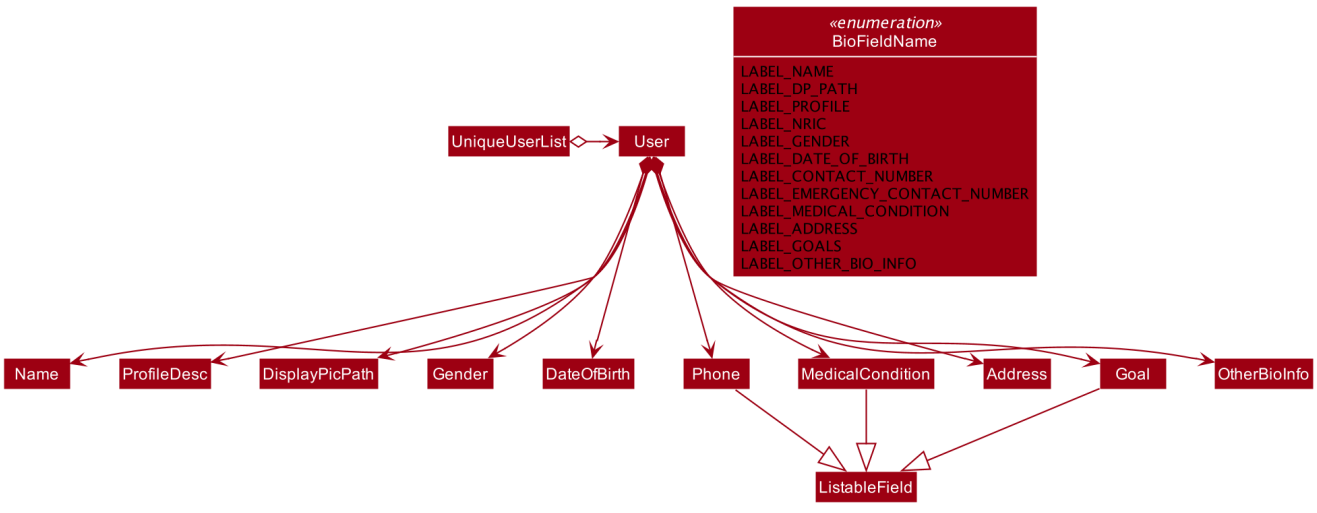
Contributions to the Developer Guide

*Given below are **samples** of sections I contributed to the Developer Guide. They showcase my ability to write technical documentation and the technical depth of my contributions to the project. The full section of personalised features in the developer guide may be accessed here while that for user stories may be accessed here.*

Personalised User Experience Feature

Overview

- The `User` class is used to represent a diabetic user. A diabetic user is composed of the `Name`, `ProfileDesc`, `DisplayPicPath`, `Nric`, `Gender`, `Phone`, `MedicalCondition`, `Address`, `Goal` and `OtherBioInfo` classes.
- A `User` is currently defined to be able to have more than one `Phone`, `MedicalCondition` and `Goal`. As such, these classes inherit the `ListableField` Interface.
- The structure of a `User` and its interactions are shown as follows:



...(Click here for more information on the overview of implementing personalised user experience in the DG.)

Implementation

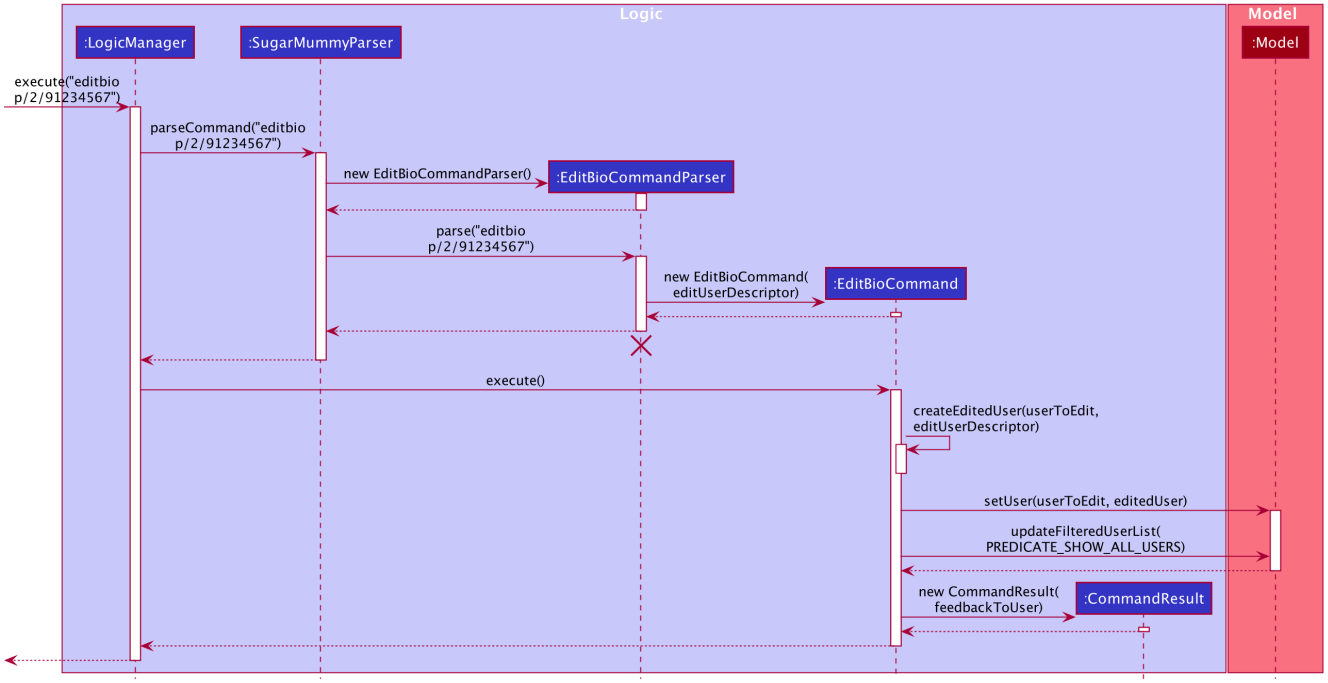
Biography

The biography feature is supported by the `addbio`, `editbio` and `clrbio` commands.

`SugarMummyParser` responds to the command word via a series of switch cases.

`addbio` and `editbio` returns `AddBioCommandParser` and `EditBioCommandParser` respectively.

- `CommandParser` then returns an `AddBioCommand` object that stores the `User` to be created. `EditBioCommandParser` on the other hand creates an `EditBioCommand` object that stores an `EditedUserDescription` containing information on which fields are edited to be edited.
    - A `List` of `HashMaps` that maps indices to `ListableField` is used in `EditedUserDescription` to denote changes to be made within each `ListableField`. When executed by `Logic` afterwards, the `AddBioCommand` creates the `User` to be stored in the `ModelManager` whereas the `EditBioCommand` creates a new `User` based on information in `EditedUserDescription`. A `UserList` is used in the `ModelManager` to store `User` instances.
    - At any point of time when a user attempts to access biography information, `LogicManager` accesses the `UserList` from `ModelManager` to display information. In order to be able to display the same information upon startup, `LogicManager` saves this `UserList` to the storage after execution of each command.
- For the `bio` and `clrbio` commands, the implementations are relatively more straightforward.
    - A `BioCommand` returned by `SugarMummyParser` simply overrides the `getDisplayPaneType()` of the `Command` object (that each `Command` object contains) so that back at `Ui`, `Ui` knows to display the `BioPane` of the `Ui` in the `MainDisplayPane` part of the window.
- An illustration of how the information flows for the `editbio` command is shown as follows:



...(Click here for more information on the implementation of biography features in the DG.)

Aesthetics

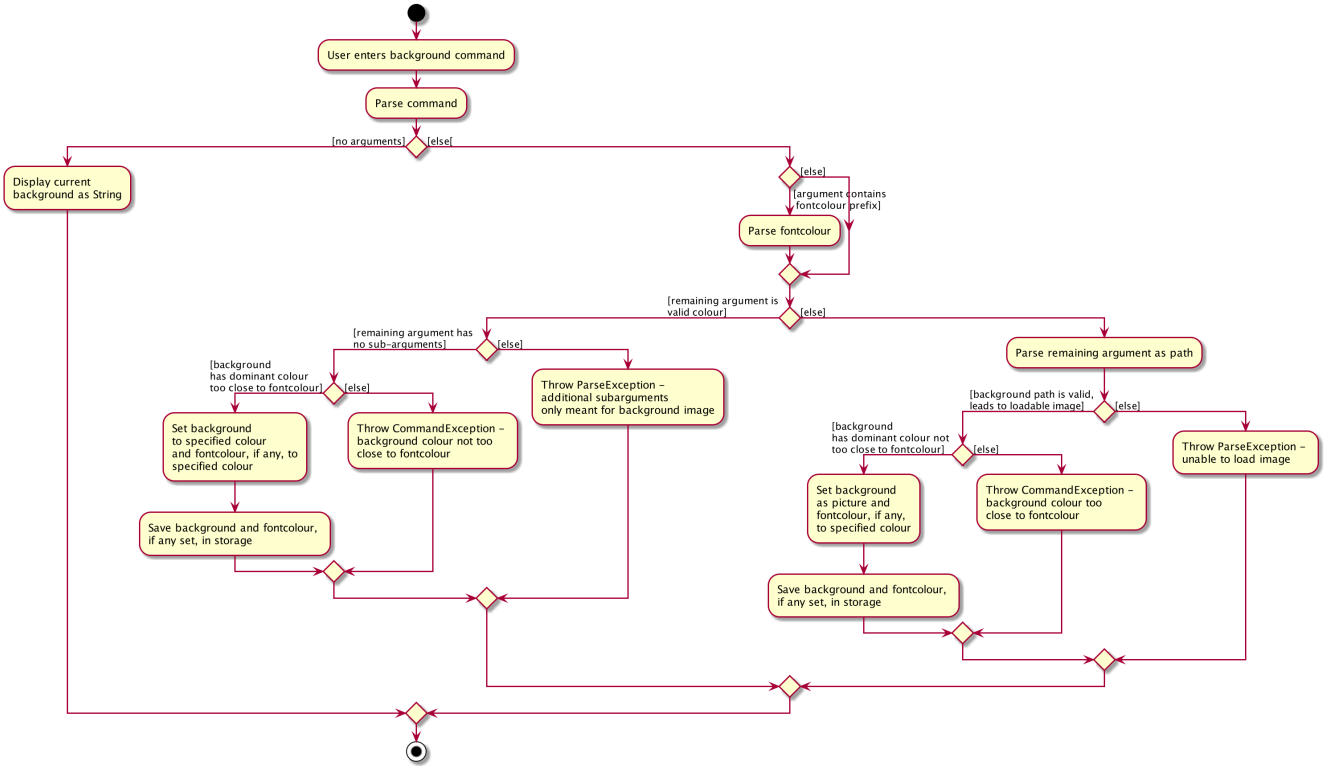
The aesthetics aspects of the application help to support the feature of personalised user experience and are implemented using the command words `fontcolour` and `bg` respectively.

`Colour` and `Background` are independent classes, and `Colour` makes use of enumerations of colour names and hexadecimal colour codes to determine validity of the colours.

- Upon receival of the command `fontcolour`, if `fontcolour` has no arguments (checked by `FontColourParser`), a new `FontColourCommand` with no arguments is returned, and upon execution return a `CommandResult` that shows the existing `fontcolour` used via access of `ModelManager` (logic is similar to the ones for biography)
    - Otherwise if arguments are received, validity of the arguments is checked against, and if the colour is a valid `Colour`, it is set in `ModelManager` and saved to Storage. `FontColourCommand` overrides the `getDisplayPane()` to return the `DisplayPane.COLOUR` enumeration. i.e. the `MainDisplayPane` is unchanged in `Ui`, and only font colours change.
- `Background` on the other hand, checks for additional possible arguments.

`BackgroundParser` first determines if the argument received is a `Colour`. If so it returns a `BackgroundCommand` storing a `Background` that has a `backgroundColour` attribute. Otherwise, it checks, via `ParserUtil` , whether or not the argument before valid prefixes (preamble) is a valid file path. If so, a `Background` that has a `backgroundPicPath` attribute is used to create the `BackgroundCommand`.

- Otherwise a `ParseException` is returned.
- An illustration of the logic for handling a `bg` command is shown as follows:

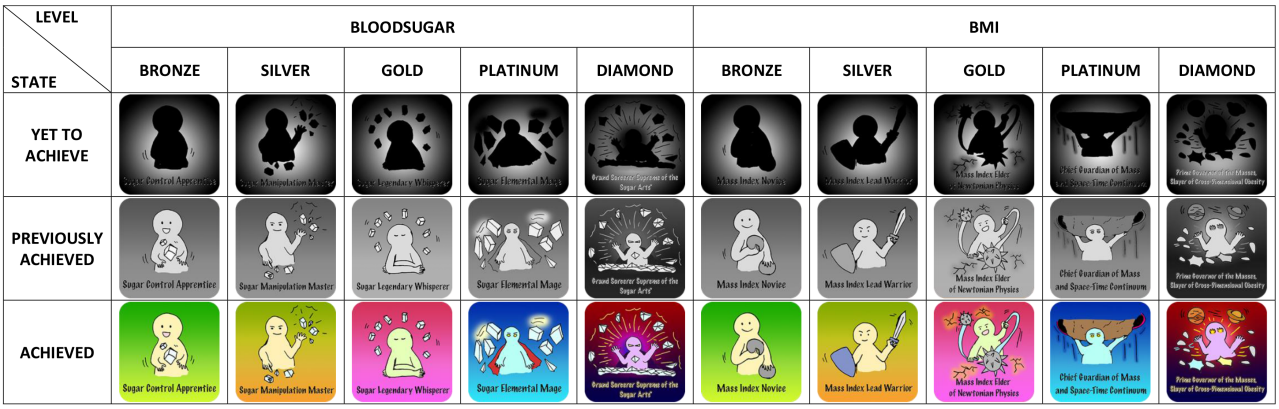


- The `ImageAnalyser` class used to determine a background image's dominant colour is inspired, collectively, by Zaz Gmy's code example and user *mhshams*'s code snippet.

...(Click here for more information on the implementation of aesthetic features in the DG.)

Achievements

- A diabetic user's `Achievements` is supported by the `achvm` command, that displays the list of user's achievements. Similar to how `bio` is implemented, `SugarMummyParser` returns an `AchievementsCommand` that overrides the `getDisplayPane()` method to return `DisplayPane.ACHVM` – such that `Ui` of `Ui` sets the children of the `MainDisplayPane` node to be the `AchievementsPane`. Each `Achievement` is represented using an `ImageView` in JavaFX `TilePane` so that all images are of the same size.
- When the program starts, an `AchievementsMap` containing a `Map` of `RecordType` to `List` of all `Achievement` objects that the program has is created in `ModelManager`.
- The `AchievementStateProcessor` class is then called, which iterates through the list of all `Record` elements stored in `ModelManager` and updates the `State` of each `Achievement` if necessary.
- Thereafter, for each addition and removal of `Record` elements, the same process described above is used to update the `AchievementsMap`, that maps `RecordType` to an `AchievementsList` of `Achievement` elements with updated `State` attributes.
- When the `achvm` command is received by the program, this `AchievementsMap` is simply retrieved from `ModelManager` to `LogicManager` and the corresponding images representing the `Achievement` objects in the list, with their `State` values, and attributes are presented to the user via the `MainDisplayPane` of the `MainWindow`.
- The full list of `Achievement` items, as well as corresponding `State` and `Level` possible to attain for each `RecordType` in the current version of the program are shown as follows:



- Each `Achievement State` is represented by hand-drawn images, which were coloured digitally using Adobe Photoshop. If a developer intends to modify or extend the current list of `Achievement` items, he or she may also modify or add on to these images that are currently located in `/view/images/achievements/` of the project directory.

...(Click here for more information on the implementation of achievement features in the DG.)

Motivation

- Motivational aspects of the application are supported using motivational quotes.
- Each motivational quote exists as a `String` in an unmodifiable `List` of the class `MotivationalQuotes`.
- The `List` of quotes (collated from different sources but modified to have the same formats) are initialised to be part of `ModelManager` when the program first starts up.
- Upon initialisation of the program, the `MotivationalQuotesLabel.fxml` file is referenced via its corresponding class.
- Retrieval of the `List` of motivational quotes is done via `LogicManager` which accesses the `List` of motivational quotes in `ModelManager`.
- A quote is randomly selected and then displayed to the user via the program's user interface.

...(Click here for more information on the implementation of motivation features in the DG.)

Design Considerations

Command Classification

- It is possible to separate the commands for `fontcolour` and `background` into different commands (eg. `addfontcolour`, `editfontcolour`, `showfontcolour`, `clrfontcolour`). However, this is likely unnecessary as this will not only require the end user to type more words, but also introduce redundancy (eg. `clrfontcolour` could simply be `fontcolour black` and still achieve the same effects as `clrfontcolour`).

Modification of Application Style Dynamically

- An alternative idea to achieving `fontcolour` and `background` throughout the entire app was to

visit each `JavaFX` child `Node` recursively and set the colours and backgrounds if the nodes are of specific instances with these attributes (eg. `Label` which has `textfill` attribute). However this idea was quickly aborted as the `TableView` implemented only renders headers after the scene has been set and to include such a case in thet recursive solution adds significant complexity to the program on top of the possibility of severely breaking abstraction.

...(Click here for more information on design considerations in the DG.)

Future Developments

Saving of user's preferred themes: `[coming in v2.0]`

This feature has not currently been implemented, but could possibly be implemented using the existing `StyleManager` class, which processes users' `background` and `fontColour`. A `List` could be used to save an archive of users' preferred themes during that session. A variable would serve as a current pointer to determine the current theme the user is using. A change in theme could be achieved by updating the pointer and / or the `HashMap`, if any is implemented. Upon termination of the program, the contents of the `HashMap` could be saved to a `JsonStorage` file.

Follow up on user's goals: `[coming in v2.0]`

This feature has yet to be implemented but could possibly be implemented by first parsing inputs that the user has entered for the `Goal` fields. If in a format that is recognised, the program would store the recognised parsed `Goal` and corresponding `LocalDate` in an `ArrayList` and `JsonStorage` file. The program would then check the user's progress over time by analysing data in the user's `RecordList`, and provide timely feedback by comparing the current date and date by which to reach the `Goal` targets set. This feature may also implement some methods from the `Reminder` feature so the user can choose to automatically be reminded about his/her `Goal` inputs at specific time intervals desired.

...(Click here for more information on future developments in the DG.)

Appendix A: User Stories

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

Priority	As a ...	I want to ...	So that I can...
`* * *`	very busy diabetic	use a flexible calendar system that can account for updates	easily make changes to appointments that I have to change often due to other commitments
`* * *`	person who likes numbers	see summary statistics	better track my progress

...(Click here for more information on user stories in the DG.)