Tan Likai - Project Portfolio

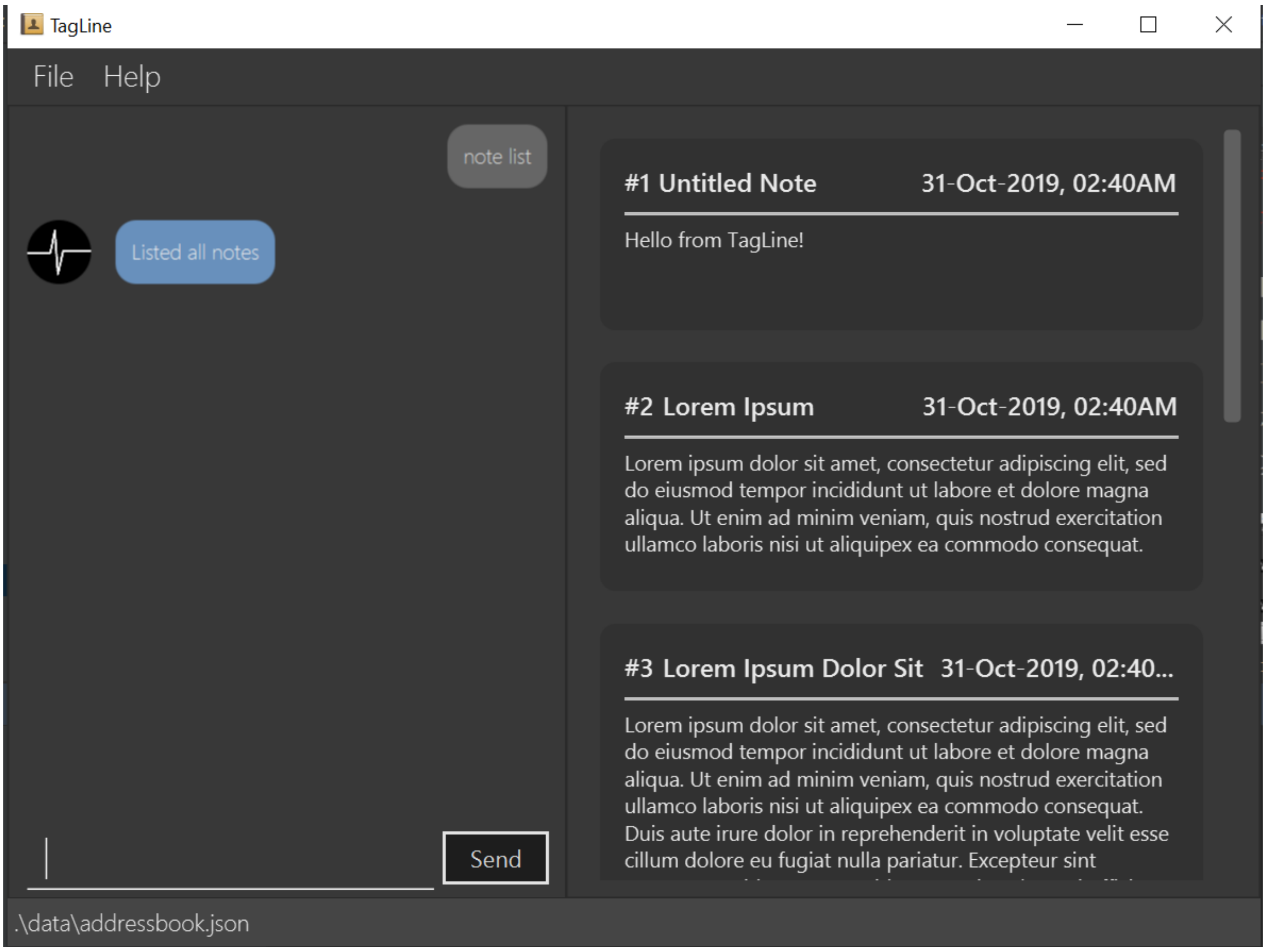
PROJECT: TagLine

About the project

My team of 5 software engineering students were tasked with enhancing a basic command line interface desktop addressbook application for our Software Engineering project.

We chose to expand the application into a note management application with contact management capabilities called **TagLine**. In addition to the originally existing operations on contacts, this enhanced application allows users to record and list notes; create groups of contacts; and tag notes with relevant hashtags, contacts or groups.

Below is a screenshot of our project:



note list

Listed all notes

#1 Untitled Note 31-Oct-2019, 02:40AM

Hello from TagLine!

#2 Lorem Ipsum 31-Oct-2019, 02:40AM

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#3 Lorem Ipsum Dolor Sit 31-Oct-2019, 02:40...

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My role was to design the UI and write Java code, FXML and CSS for it. The following sections illustrate some more specific enhancements I have made to the UI, as well as some relevant documentation in the user and developer guides related to these enhancements.

Summary of contributions

- **Major enhancement**: I added **autocomplete** for commands in TagLine.
  - What it does: When the user starts typing a command, a list of autocomplete suggestions will be shown below the command box.
  - Justification: This feature benefits new users by allowing them to understand all the possible commands in TagLine.
  - Highlights: I implemented `AutoCompleteNode` using a search tree, so that it only gets the most relevant suggestions. Additionally, using CSS, I applied a custom skin to the default ControlsFX autocomplete popup.
  - Credits: I used the ControlsFX library for the GUI implementation of the autocomplete box.
- **Major enhancement**: I added **user prompting** for commands in TagLine.
  - What it does: TagLine can detect if a command entered by the user is missing some information. For example, a user may forget to indicate the name when adding a contact. In that case, the TagLine chatbot will ask the user for the name of the contact.

    As an extension, using the same framework, TagLine can request confirmation when performing major changes like clearing the contact or note list.
  - Justification: This feature benefits inexperienced users by allowing them to easily fix mistakes without having to retype entire commands. Also, it allows for an alternative method of inputting commands field by field, which may be preferable to some users.
  - Highlights: This feature required implementing additional interactions between the `Ui` and the `Logic` components, which was done using an intermediate class to pass prompts. I also had to design a new program flow for the `Ui` to handle user prompts.

    To increase user-friendliness, I included messages to tell the user when they are being prompted, and disabled autocomplete when the user enters the response.

    For future commands, this feature is easily extensible as it only requires the new `Parser` to throw an exception requesting some prompts.
- **Minor enhancement**: I added the GUI views for listing notes, viewing a single group and listing groups. I also refactored the original contact list to be able to hide empty fields.
- **Minor enhancement**: I implemented a chat interface for communicating with the user.
  - Credits: I reused my code from my individual project to build the chat interface.
- **Code contributed**: [RepoSense report]
- **Other contributions**:
  - Project management:
    - Handled releases `v1.1` - `v1.3` (3 releases) on GitHub
    - Setup Coveralls
  - Enhancements to existing features:

        - Wrote GUI tests to test new and old components of the UI, increasing coverage for the `tagline.ui` package to 65.6%
    - Community:
        - PRs reviewed (with non-trivial review comments): #140, #68, #105
        - Reported bugs and suggestions for other teams: #96, #95
    - Tools:
        - Integrated ControlsFX to the project for the autocomplete feature (#42)
        - Integrated TestFX to the team repo to write and perform GUI tests.
        - Integrated Hamcrest to the team repo to write GUI tests.

Contributions to the User Guide

Given below are sections I contributed to the User Guide. They showcase my ability to write documentation targeting end-users.

Learning TagLine

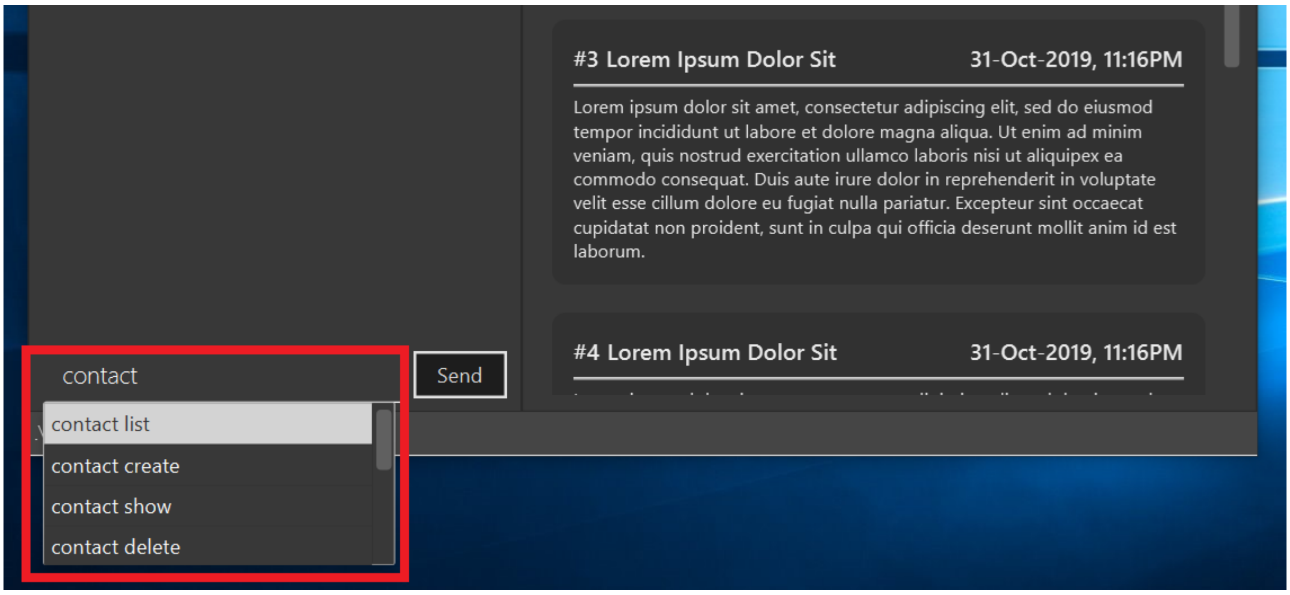
Are you new to TagLine? Or are you prone to making typos? In either case, TagLine has some nifty features to help you out.

Autocomplete

When you enter a command, TagLine will display autocomplete suggestions as you type.

To illustrate, let’s suppose you are trying to create a new contact. However, you only remember that the first keyword is `contact`! With the autocomplete feature, it is easy to find the correct command. Try following the following steps:

1. Type `contact` into the command box, followed by a space. A list of suggestions will pop up under the command bar.



#3 Lorem Ipsum Dolor Sit 31-Oct-2019, 11:16PM

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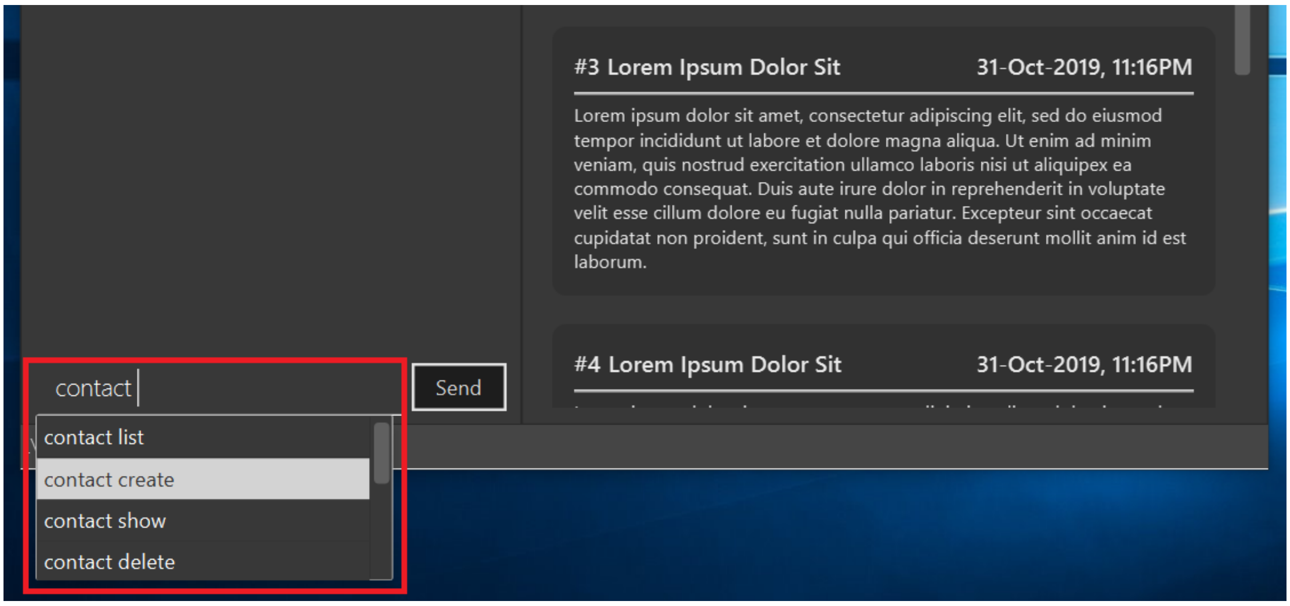
2. Use the arrow keys to navigate to the correct command (optional if using mouse).



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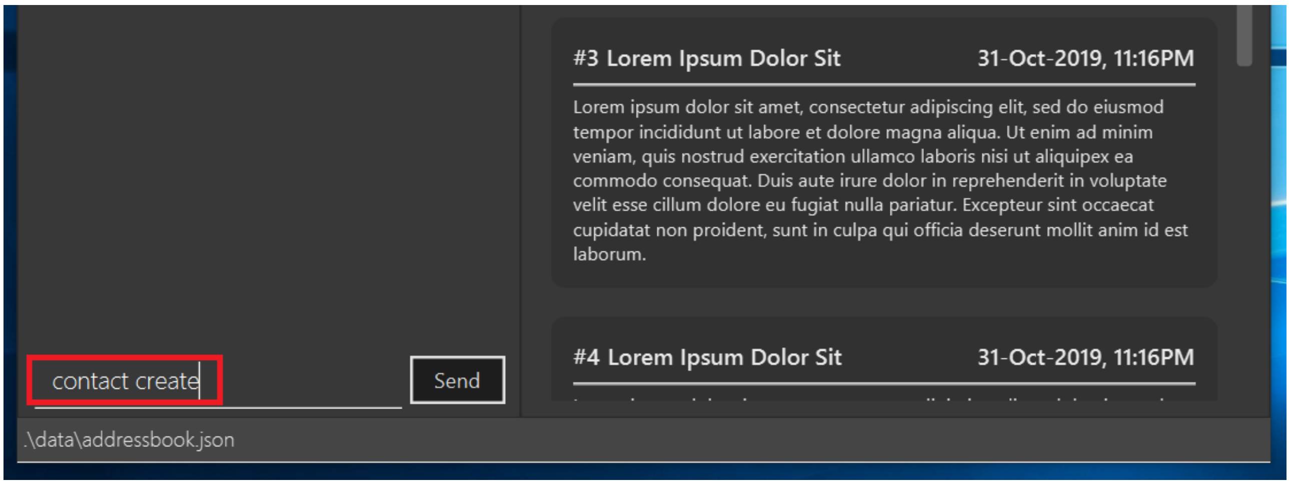
3. Press the Enter key or click on the command in the menu. Your command box will now display `contact create`.



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Note

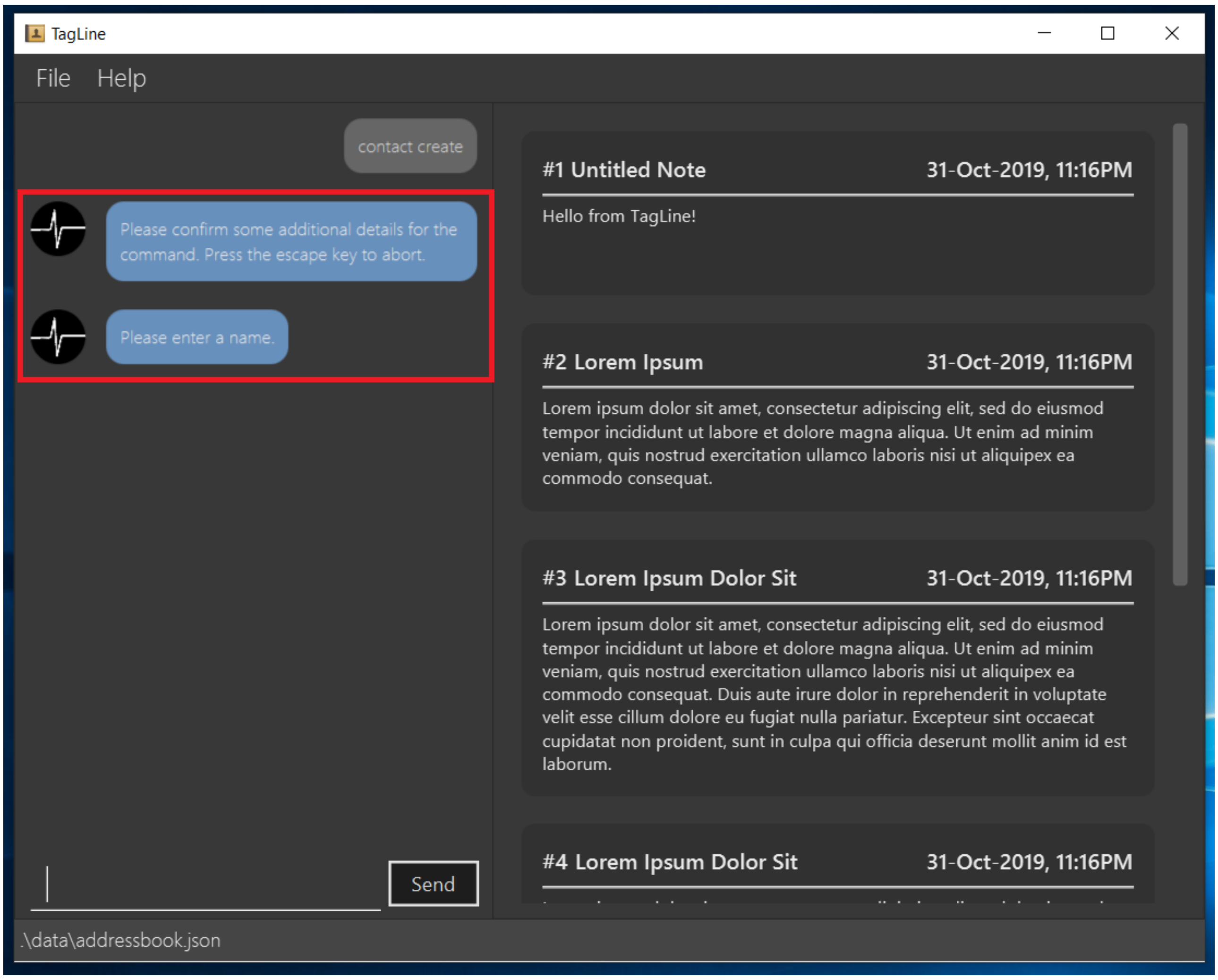
After typing a command, if the autocomplete menu is still showing, please wait a moment for it to disappear, or click elsewhere on the screen. If you press Enter too quickly, this will cause your command to be overwritten.

Prompts

For some commands, TagLine can prompt you when there is missing important information. Instead of having to type the whole command again, you will only need to fill in the couple of fields you missed.

Let's take the same example of creating a new contact.

1. Suppose you accidentally pressed Enter too early, and sent the command `contact create` as is.



contact create

Please confirm some additional details for the command. Press the escape key to abort.

Please enter a name.

#1 Untitled Note 31-Oct-2019, 11:16PM

Hello from TagLine!

#2 Lorem Ipsum 31-Oct-2019, 11:16PM

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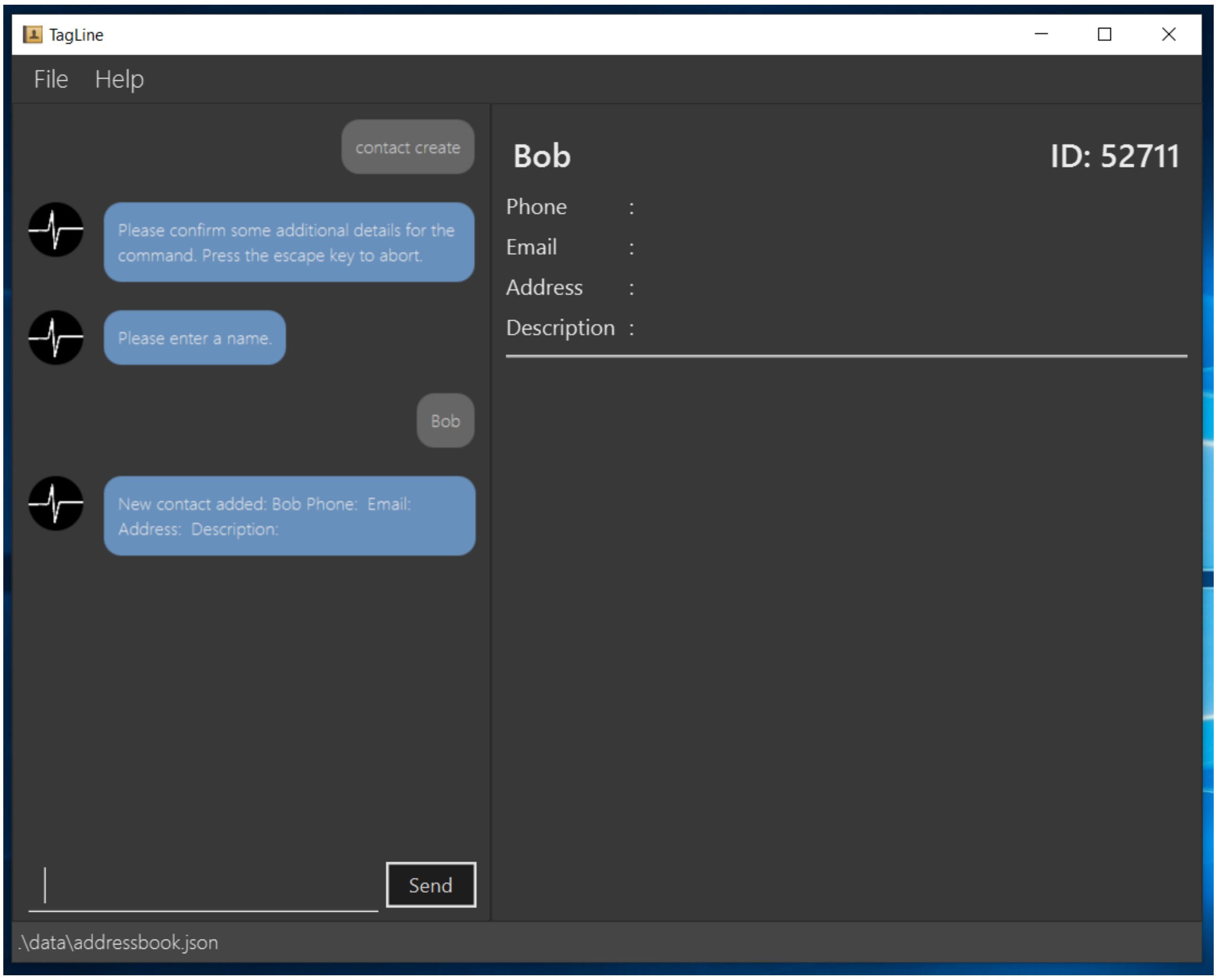
2. Maybe you have intended to call this new contact `Bob`. Then type `Bob` into the command box and press Enter (or Send). Then TagLine would appear like this:



contact create

Please confirm some additional details for the command. Press the escape key to abort.

Please enter a name.

Bob

New contact added: Bob Phone: Email: Address: Description:

Bob ID: 52711

Phone :
Email :
Address :
Description :

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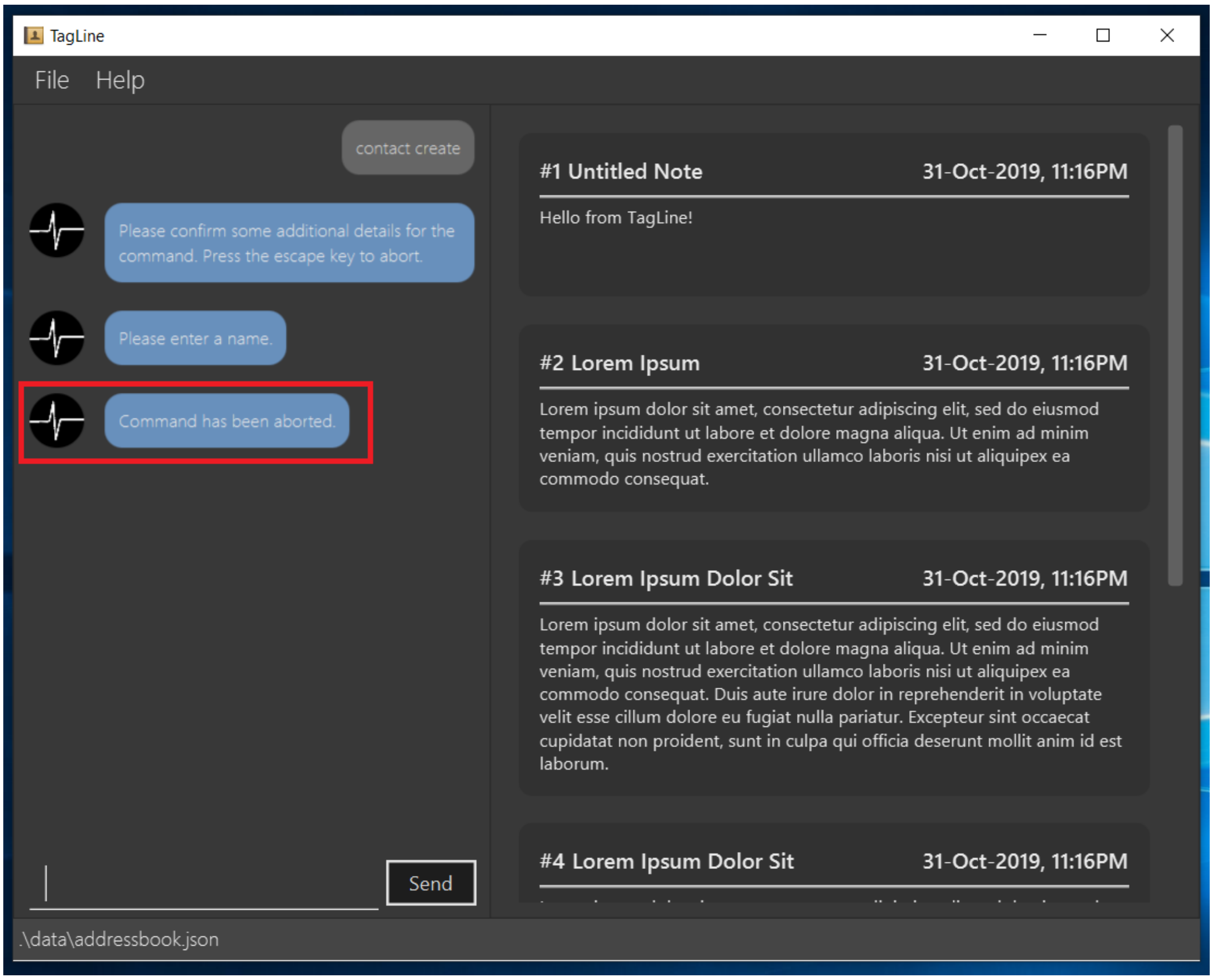
3. As can be seen above, TagLine has successfully created a new contact named `Bob`.

Aborting an incomplete command

But what if we don’t want to proceed with the command? You can abort the command by pressing the Escape key.

a. After step 1 of the above example, let’s say you no longer want to create a new contact. Press the Escape key.



contact create

Please confirm some additional details for the command. Press the escape key to abort.

Please enter a name.

Command has been aborted.

#1 Untitled Note 31-Oct-2019, 11:16PM

Hello from TagLine!

#2 Lorem Ipsum 31-Oct-2019, 11:16PM

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b. The incomplete command will not be executed. Now you can continue to enter other commands into the command box.

Note

When given prompts, to minimize inconvenience to you, the autocomplete menu is temporarily disabled. Once prompting is complete or aborted, autocomplete will be re-enabled.

Contributions to the Developer Guide

Given below are 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.

UI component

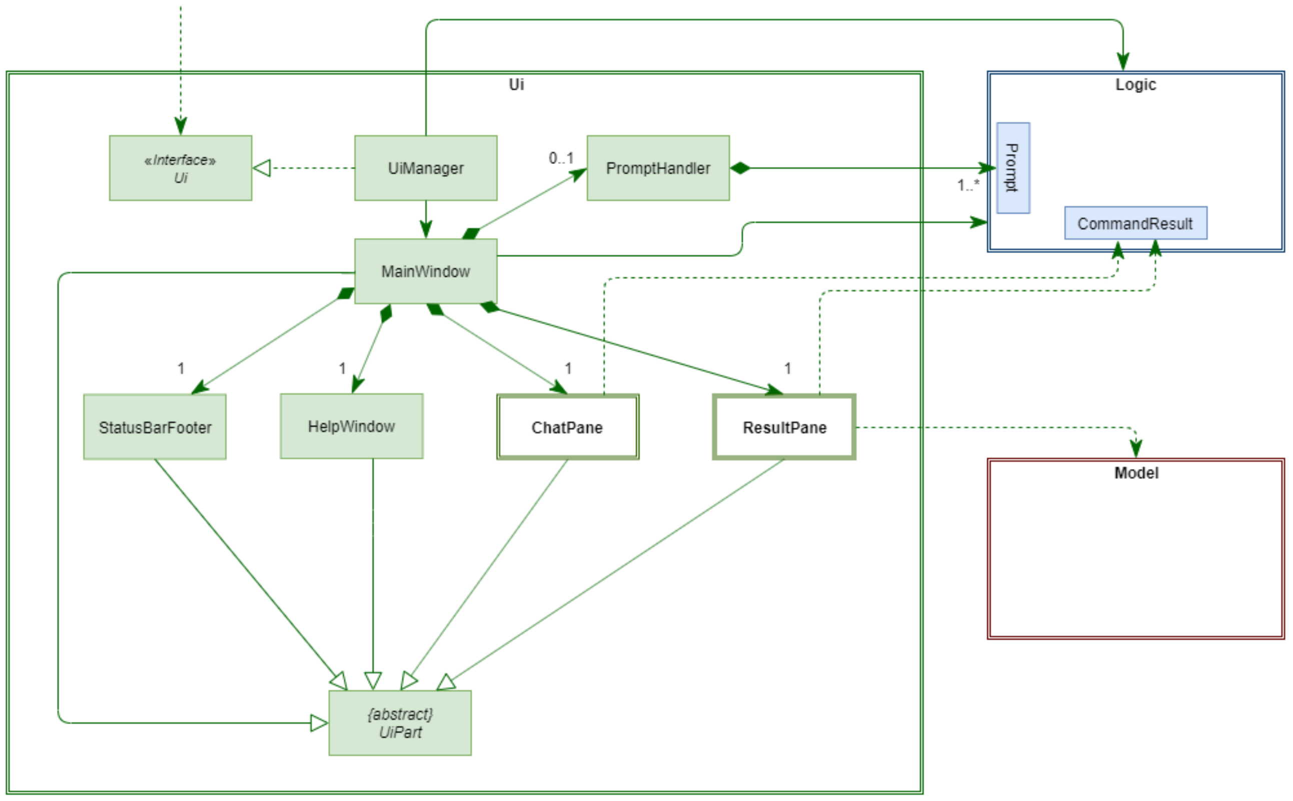


Figure 1. Structure of the UI Component

API : `Ui.java`

The UI consists of a `MainWindow` which is made up of four parts, i.e. `StatusBarFooter`, `HelpWindow`, `ChatPane` and `ResultPane`. `MainWindow` may also have a `PromptHandler` which contains a list of `Prompt` objects (see here for more information). In particular,

- The `ChatPane` manages text interaction with the user. It uses `CommandBox` to read commands and `DialogBox` to display commands and feedback. To handle auto-completion, `CommandBox` uses an `AutoCompleteNode` to provide suggestions. The class diagram for the sub-component is shown below.

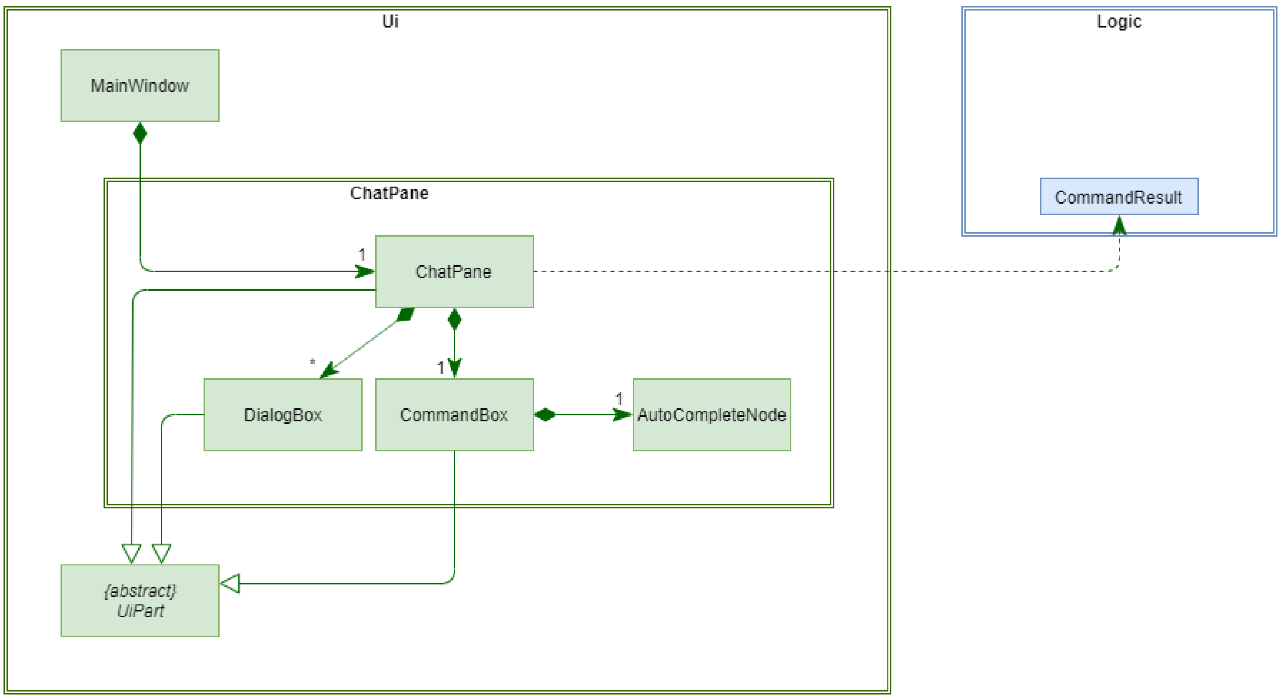


Figure 2. Structure of the Chat Pane sub-component

- The `ResultPane` displays a relevant `ResultView` based on the command entered. The following class diagram shows a partial view of the component with only the `NoteListResultView` and `ContactListResultView`.

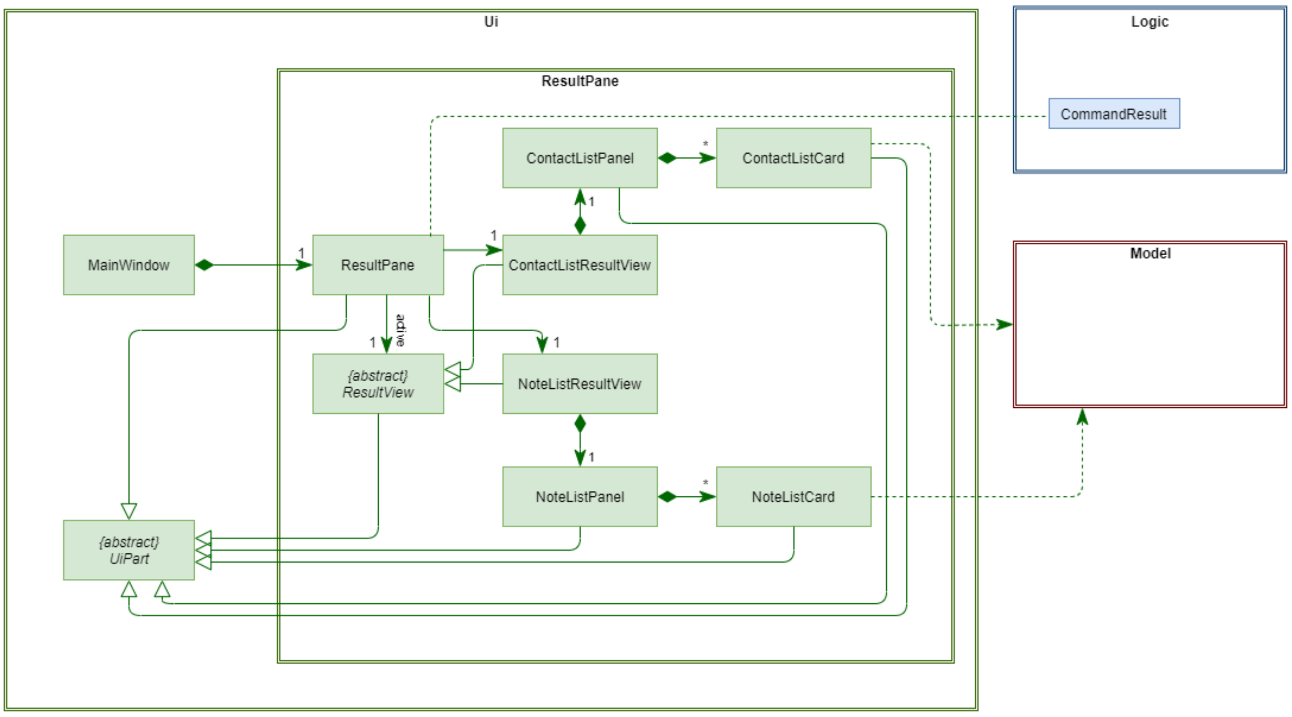


Figure 3. Structure of the Result Pane sub-component

Most of these classes, including the `MainWindow` itself, inherit from the abstract `UiPart` class.

The `UI` component uses JavaFx UI framework. The layout of these UI parts are defined in matching `.fxml` files that are in the `src/main/resources/view` folder. For example, the layout of the `MainWindow` is specified in `MainWindow.fxml`

The `UI` component,

- Executes user commands using the `Logic` component.
- Displays feedback and updates the `ResultPane` using `CommandResult` in the `Logic` component.
- Listens for changes to `Model` data so that the UI can be updated with the modified data.

User Prompting

Description

When the user enters an incomplete command, the command could be missing only a few compulsory fields. Instead of forcing the user to edit the command entirely, TagLine will prompt the user for further details instead.

At this point, the user may abort the command or provide the requested details. When all details are provided, the command is executed.

Implementation

Representing a prompt

The prompting mechanism uses `Prompt` objects to represent individual queries for additional information. A list of `Prompt` objects is used to pass information between the `Logic` and `Ui` components. `Prompt` contains the following fields:

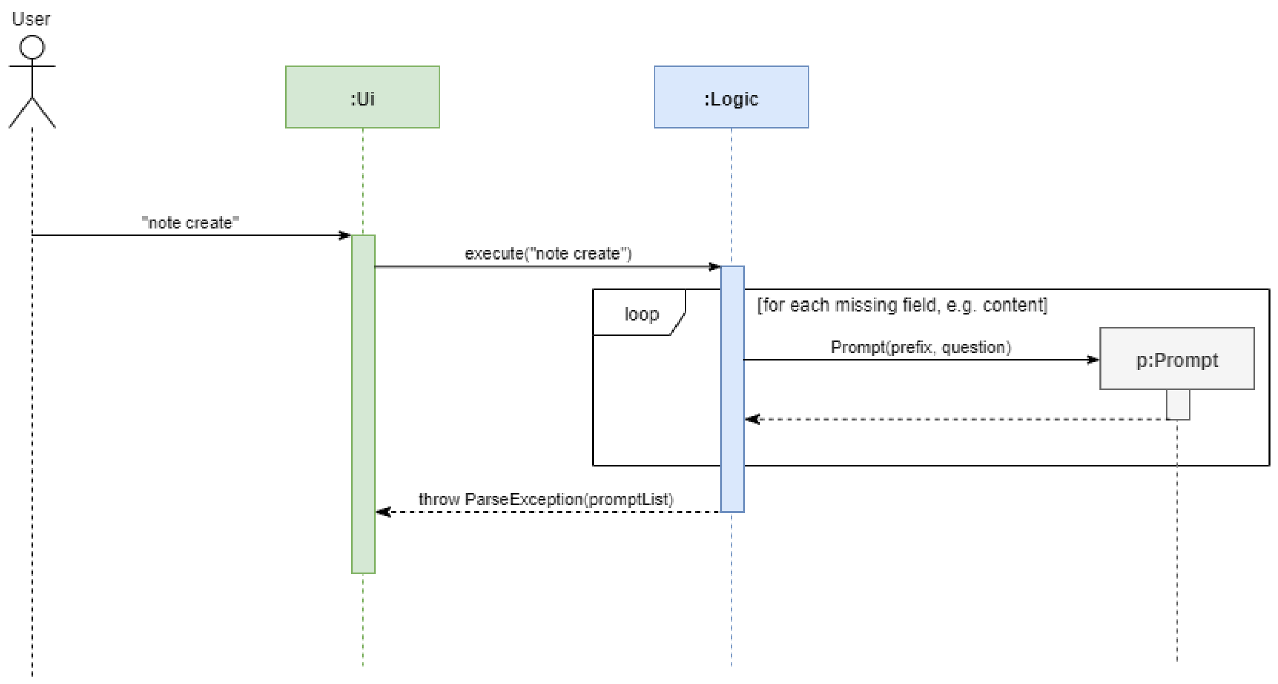
- `prefix`: The prefix of the missing field (e.g. for a `contact create` command, the `name` field has prefix `--n`)
- `question`: A question to ask the user for details regarding the missing information
- `response`: The response from the user

These fields are accessible through getters and setters in the `Prompt` class.

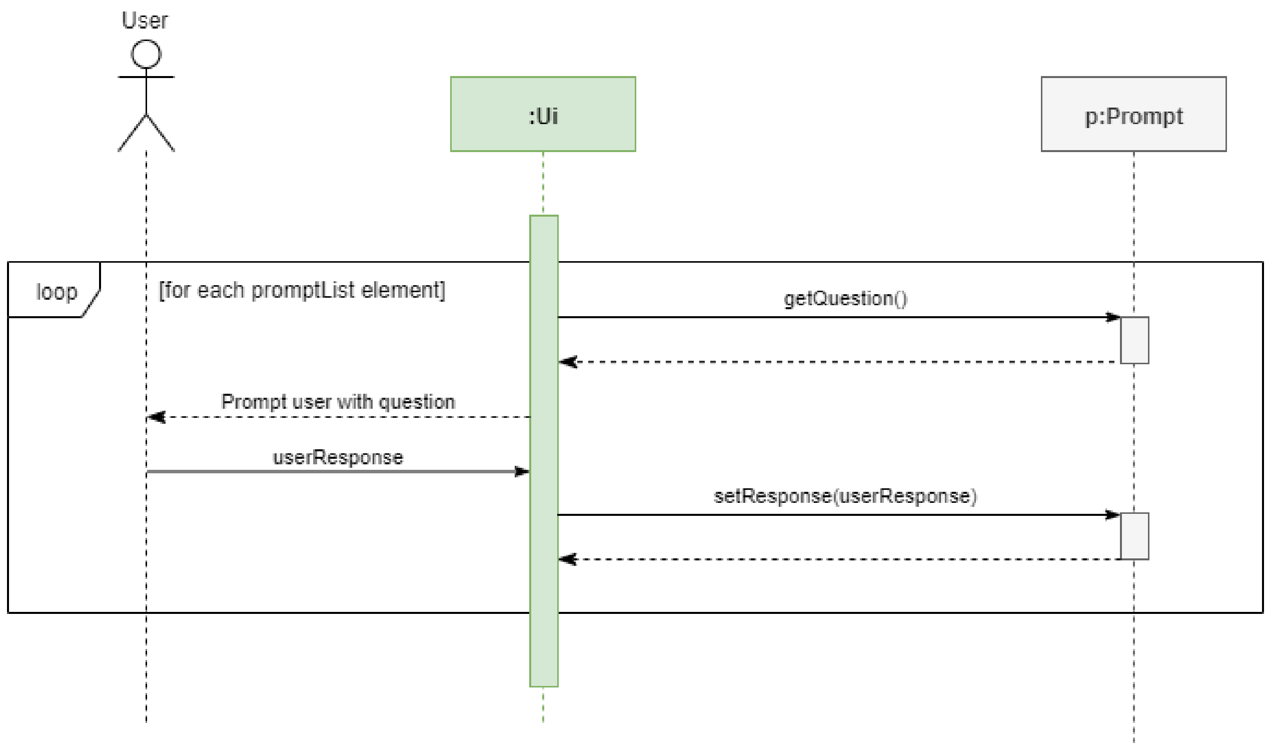
Passing the prompts

Given below is an example scenario where the user command has missing compulsory fields.

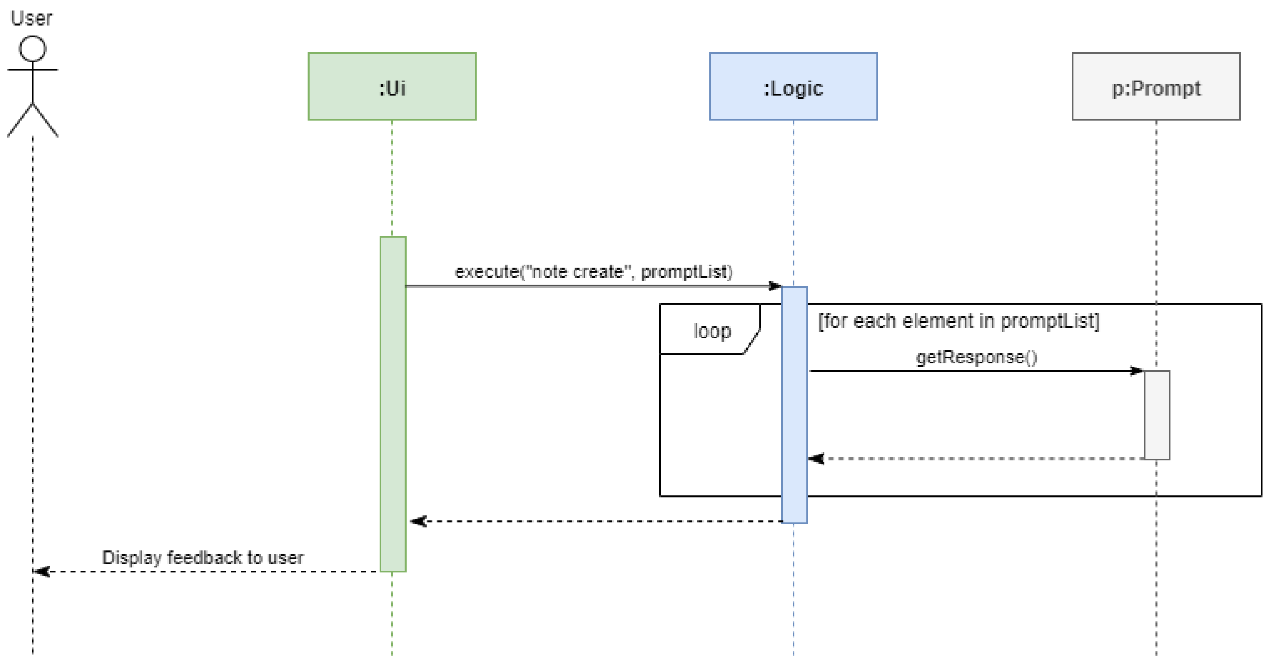
Step 1: The `Ui` passes the user’s command to `Logic`, which finds one or more missing compulsory fields. For each missing field, it creates a new `Prompt` object with a question. Then it throws a `ParseException` containing the list of `Prompt` objects.



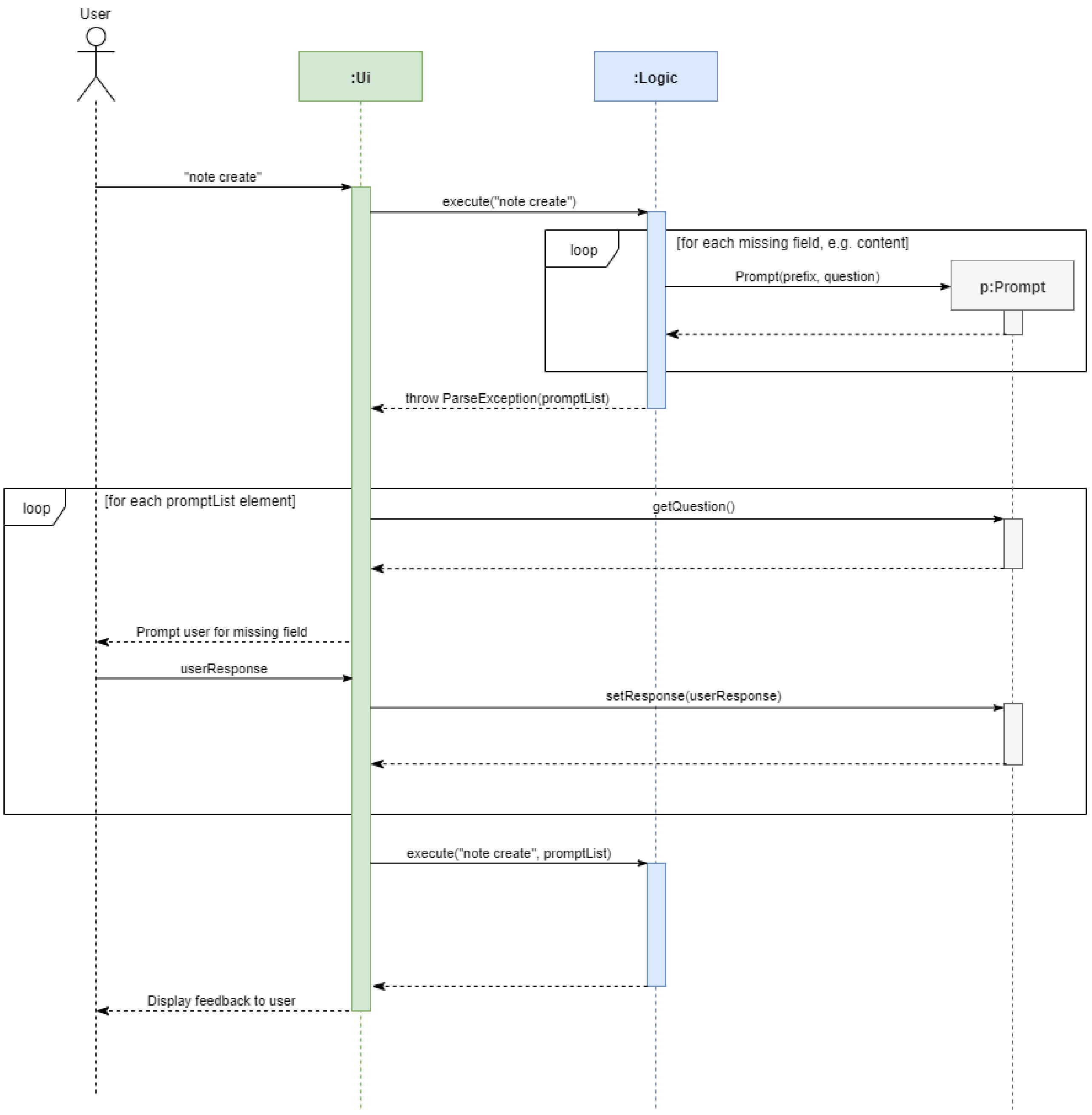
Step 2: The `Ui` receives the list of `Prompt` objects. For each `Prompt`, it retrieves the question and obtains the corresponding user feedback using the mechanism here.


User
:Ui
p:Prompt
loop
[for each promptList element]
getQuestion()
Prompt user with question
userResponse
setResponse(userResponse)

Step 3: The `Ui` passes the original command, together with the processed `Prompt` objects, back to `Logic`. `Logic` then executes the corrected command.


User
:Ui
:Logic
p:Prompt
execute("note create", promptList)
loop
[for each element in promptList]
getResponse()
Display feedback to user

The full sequence diagram is shown below:


User
:Ui
:Logic
"note create"
execute("note create")
loop
[for each missing field, e.g. content]
Prompt(prefix, question)
p:Prompt
throw ParseException(promptList)
loop
[for each promptList element]
getQuestion()
Prompt user for missing field
userResponse
setResponse(userResponse)
execute("note create", promptList)
Display feedback to user

The user can also abort the command by pressing the Escape button. In this case, the `Ui` will discard the original command and continue to receive further user commands.

Getting prompts from the user

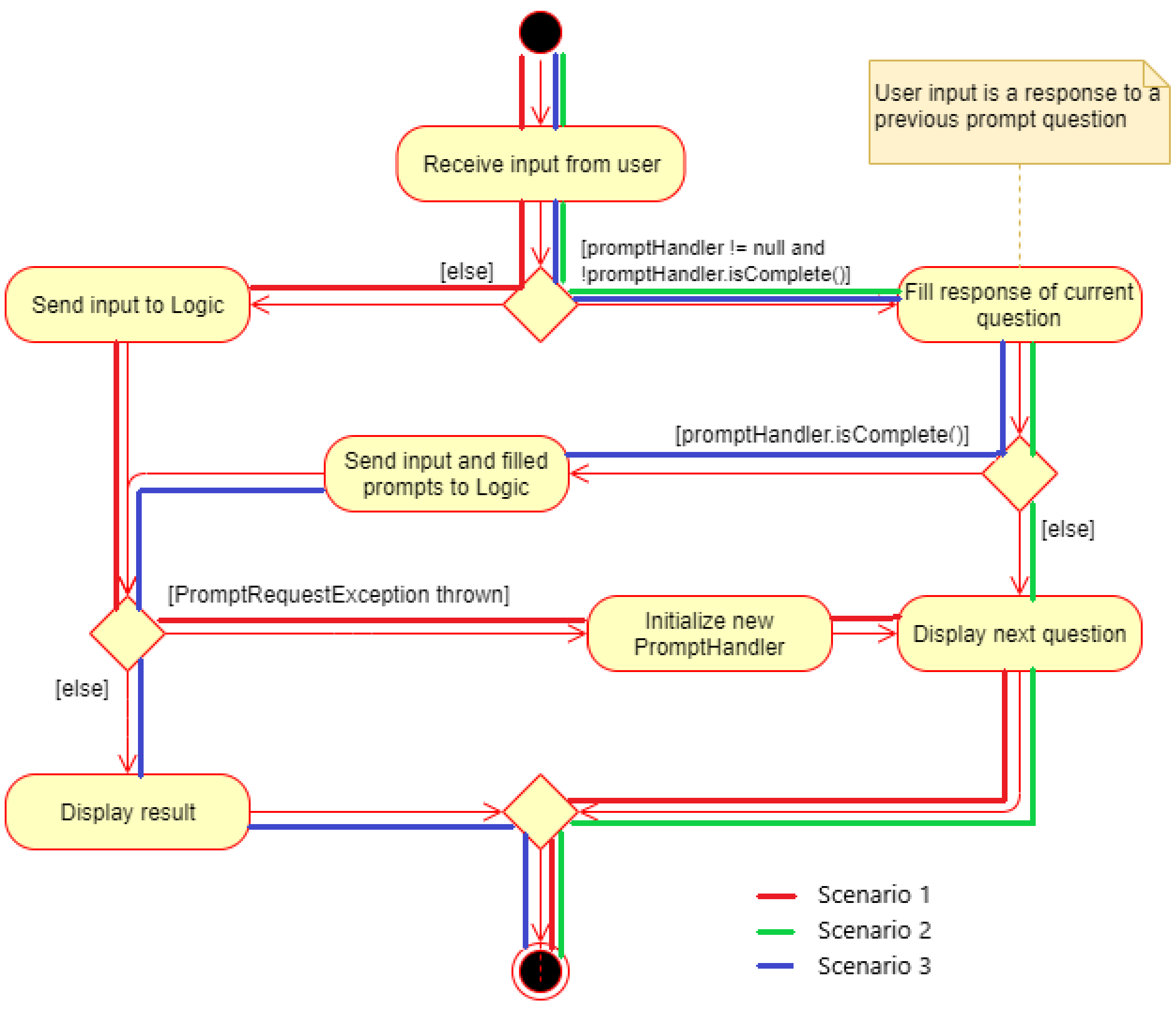
To obtain responses to a list of prompts, the UI uses a `PromptHandler` to indicate the incomplete command that it is currently working on. `PromptHandler` uses the Iterator design pattern to fill a list of prompts. It implements the following operations:

- `PromptHandler#getPendingCommand`: Returns the incomplete command
- `PromptHandler#fillNextPrompt`: Fills the next unfilled prompt in the list
- `PromptHandler#getNextPrompt`: Gets the question of the next unfilled prompt in the list
- `PromptHandler#isComplete`: Returns true if all prompts have been filled
- `PromptHandler#getFilledPromptList`: Gets the filled prompt list

To allow the `Ui` to handle user prompts, the sequence of steps taken to handle user input has been modified. To illustrate the program flow, three possible scenarios of user input will be discussed.

1. The user enters some input with missing compulsory fields.
   a. The input is passed to `Logic`, where a `PromptRequestException` is thrown.
   b. `MainWindow` takes the list of prompts in the `PromptRequestException`, and creates a new `PromptHandler` in the private field `promptHandler`.
   c. `MainWindow` gets the first prompt question from `promptHandler` and displays it.
2. The user is currently being prompted, and enters some input to answer a prompt. There are more prompts remaining.
   a. `MainWindow` has a `promptHandler` which is incomplete. It calls `fillNextPrompt` with the user input.
   b. `MainWindow` checks that `promptHandler` is still incomplete.
   c. `MainWindow` gets the next prompt question from `promptHandler` and displays it.
3. The user is currently being prompted, and enters some input to answer a prompt. There are no more prompts remaining.
   a. `MainWindow` has a `promptHandler` which is incomplete. It calls `fillNextPrompt` with the user input.
   b. `MainWindow` checks that `promptHandler` is now complete.
   c. `MainWindow` calls `getPendingCommand` and `getFilledPromptList` of `promptHandler`.
   d. The incomplete command and the filled prompt list are passed to `Logic` to execute the command.

The cases above are labelled and summarized in the full activity diagram below. The mechanism for aborting commands is done using listeners and not shown below.



User input is a response to a previous prompt question
Receive input from user
[else]
[promptHandler != null and !promptHandler.isComplete()]
Send input to Logic
Fill response of current question
[promptHandler.isComplete()]
Send input and filled prompts to Logic
[else]
[PromptRequestException thrown]
Initialize new PromptHandler
Display next question
[else]
Display result
Scenario 1
Scenario 2
Scenario 3

Figure 4. Overall activity diagram for handling user input

Design Considerations

Aspect: Prompt handling method

- **Alternative 1**: The `Ui` functions as per before and is unaware of prompting. The `Logic` keeps track of the incomplete command and sends prompts back as `CommandResult` objects.
    - Pros: Decreases coupling between `Ui` and `Logic` components
    - Cons: Violates the Single Responsibility Principle for `CommandResult`, i.e. `CommandResult` may now have to change because of changes to the prompting feature

      `Ui` has no way to know if it is currently handling prompting, so it cannot abort prompts, disable/enable autocomplete or display special messages.
- **Alternative 2**: The `Logic` component keeps track of the incomplete command and throws an exception containing prompts to the `Ui`.
    - Pros: Greater flexibility for `Ui` to handle prompts, e.g. aborting
    - Cons: `LogicManager` has to keep track of the command entered, rather than simply acting as a

bridge between the `Ui` and the `Parser` sub-component. Increases number of potential points of failure and decreases maintainability.

- **Alternative 3**: The `Logic` component requests prompts from the `Ui`. The `Ui` component keeps track of the incomplete command.
    - Pros: Greater flexibility for `Ui` to handle prompts, e.g. aborting

Alternative 3 was chosen as it allows for flexibility in prompt handling while having `Ui` be the sole component responsible for collecting prompt responses.

Aspect: Command correction method

- **Alternative 1**: The `Ui` updates the command with the user's responses by adding the new data to the command string.
    - Pros: No need to overload `Logic#execute()` and `Parser#parse()` methods
    - Cons: Requires `Ui` to know where to insert preambles, and increases coupling between `Ui` and `Logic` components (as `Ui` now needs to know and follow the command format)
- **Alternative 2**: The `LogicManager` updates the command with the user's responses by adding the new data to the command string.
    - Pros: No need to overload `Parser#parse()` method
    - Cons: Requires `LogicManager` to know where to insert preambles, and reduces flexibility of prompting
- **Alternative 3**: `TaglineParser` and the individual parser classes handle the list of `Prompt` objects when parsing the command
    - Pros: Easily handles preambles, and also allows greater extensibility of the prompt feature, e.g. can have the user fix incorrect commands or confirm actions
    - Cons: Requires changing multiple `Parser` classes, may increase code duplication

Alternative 3 is chosen as it allows the confirmation messages for the `clear` commands to be implemented easily.

For Alternative 1 and 2, implementing confirmation would inadvertently add an alternative command to directly perform the action. To illustrate, suppose we check for confirmation for the `contact clear` command by having the user type `YES`. Then due to the mechanism of the prompting feature, we will inadvertently include a new command like `contact clear <prefix> YES`. Since this is unintuitive, alternative 3 was chosen instead.