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Project Analysis Report
Better Notes

Team 01E 5: Accidental Consequences

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1. Introduction

Memory is a large problem for both elderly and mentally challenged peoples. As such our team plans to create a program that could in some way improve the daily lives of this particular group of people. While there are many different implementations of similar ideas, much behind memory issues tend to stem from under-stimulation. The base idea we plan to tackle is to give people some method of storing the information they need in an intuitive way that could also give them the opportunity to remember what was written using images, rather than simply using words that may become jumbled or lost in the mental process.

Our team has decided to create a program that allows users to organize information into a more convenient list. Ordering information and displaying it in multiple different methods will allow users to be able to either remember, or choose to be reminded in formats that may be convenient or helpful to them. Overall, the project has the guiding purpose of simplifying the lives of people with mental disabilities.

2. Requirements Analysis

2.a. Overview

With the improvement of technology and the internet they have provided ways of assisting people with daily challenges in their lives. The abilities to set reminders for certain events, add alarms for certain times, being able to talk to people all over the country, and overall make the daily task of life seem less daunting.

However, regarding people with memory difficulty, such as older people or people who are mentally challenged, while technology has benefited these people in many different ways, it is still lacking certain assistance for their needs. Although we do have software for helping memory such as notepad software where, they can make notes to remember information, not all these notepads will remind these people of the notes they made, or have these notes in a way that is more than just words on a paper; that alone does not help with memory recovery.

2.b. Functional Requirements

- The user will be able to insert images into a note
- The user will be able to insert videos into a note
- The user will be able to convert selected text to speech

- The user will be able to convert speech to inline text
- The user will be able to convert a note to PDF
- The user will be able to set up reminders via Windows Toast Notifications
- The user will be able to set up reminders via Email
- The user will be able to set up reminders via text message.
- The user will be able to open and view recent notes
- The user will be able to insert returned text to speech to the document
- The user will be able to save the note to a chosen directory.
- The program will display relative short summaries to user of each note (creation date, other metadata values)
- The program will keep relative metadata (name/username)

2.c. Nonfunctional Requirements

Category	Nonfunctional Requirement
Reliability	<ul style="list-style-type: none"> • Program will offer consistent recent items view • Program will function on minimum Windows hardware requirements for the target environment
Performance	<ul style="list-style-type: none"> • Program will not interfere with operation of other programs on a users computer • Program will clean up work areas (extracted notes, temp directories)
Implementation	<ul style="list-style-type: none"> • Program will be usable on any version of Windows 10 past target environment build (Anniversary Edition)
Operation	<ul style="list-style-type: none"> • Program will be usable by visually impaired (if user has appropriate software installed, not required for operation)
Integration	<ul style="list-style-type: none"> • Program will allow for reminders to be sent in already existing formats on Windows or System.Net

Table 2.c.i: Table containing the nonfunctional requirements of BetterNotes

2.d. Constraints

Constraints on the system are plentiful in multiple different ways. Most of these constraints are purposefully created and controlled by metadata stored by the application. For example, expected input and output of a static function will

usually pass an object that is of type note. As a more specific example: contact information will be stored in a certain format as declared by requirements below:

- Saved email must have no whitespace, must be valid email
- Saved phone number must be US number from Verizon, AT&T, or T-Mobile
 - Format: CAR#####
 - E.G.: VZW9124784848
 - VZW = Verizon
 - ATT = AT&T
 - TMO = Tmobile

Further requirements exhibit themselves in physically storing a note object, this will be done by keeping metadata relevant to each property of the note object, and will store complex variables, like the text block, or images, in their own format. All of this information will be collated and archived, this archive would have our own file extension (for easy recognition and to prevent users from opening the file accidentally) .bnot. Keeping data within constraints will be error checked, however, this error checking will have to be in place in accordance with the note object. Overall constraints are relatively simplistic, and will be managed by in-place code to transform this information into relevant metadata to either be stored alongside a note, or to be stored alongside the program in a temporary directory (likely %appdata%).

2.e. Scenarios

[Actor: user]

[OpenNote] [OpenReminder]

[Summary] Opens the selected note from the home page / file explorer.

[Flow of Events]

1. User either opens file from file explorer, or uses an OpenFileDialog to open a file from the program
2. Program will unarchive note and save it to metadata folder
3. Program will read metadata of note

[AddNote]

[Summary] Creates a new note by creating an object and placing metadata

[Flow of Events]

1. User clicks new
2. User inserts pertinent requested information
3. New note object and metadata is created

[AddReminder]

[Summary] Creates a new reminder by creating note object and placing metadata

[Flow of Events]

1. User creates new note
2. User provides note information
3. User selects reminder option
4. User provides reminder information
5. New note object and metadata is created

[SwitchToResourcesTab]

[Summary] Open the resources tab to the user's currently opened notes / reminder.

[Flow of Events]

1. User selects resources
2. User can now perform SearchImage, SearchVideo, SetReminder, STT and TTS

[SearchImage]

[Summary] Based on text the user provided in a textbox located in the image section of the resource tab, this will search for images and list their preview.

[Flow of Events]

1. User highlights a string in a textbox, or entered a search term manually in the resources tab
2. User can now InsertImage

[InsertImage]

[Summary] Insert the currently selected image to the current note.

[Flow of Events]

1. User clicks on image they want to insert into current cursor location on textbox
2. Image is downloaded and saved to note file
3. Image is inserted

[SearchVideo]

[Summary] Based on text the user provided in a textbox located in the video section of the resource tab, this will search for video and list their preview based on text the user provided in a textbox.

[Flow of Events]

1. User highlights a string in a textbox, or entered a search term manually in the resources tab
2. User can now InsetVideo

[InsertVideo]

[Summary] Insert the currently selected video to the current note.

[Flow of Events]

1. User clicks on video they want to insert into current cursor location on textbox
2. Image is embedded into the textbox

[TextToSpeech]

[Summary] Converts text from the textbox located in the TTS section of the resource tab to the current note.

[Flow of Events]

1. User highlights text or clicks text to speech in resources tab
2. User receives audio (either system or recorded) that user can play

[SpeechToText]

[Summary] Using the System's microphone, the detected audio will be converted to text and inserted to the current note.

[Flow of Events]

1. User clicks speech to text in resources tab
2. User clicks record
3. Recording is then processed and returned as string
4. String is inserted in user selected area

[SetReminder]

[Summary] Set the time for the reminder.

[Flow of Events]

1. User selects reminder option
2. User provides reminder information (time, date, type)
3. Metadata is edited to reflect changes

[SaveNote]

[Summary] Saves the current note, the associated reminder (if any), and the resources such as images and videos by archiving them into a format (.bnot), and the system will update the reminder data based on the note's reminder.

[Flow of Events]

1. User clicks save
2. SaveFileDialog opens requesting location of file (saves a dummy file)
3. The note is archived, resulting archive is save at the path retrieved from SaveFileDialog

[ConvertPDF]

[Summary] Converts the current note to a PDF file.

[Flow of Events]

1. User clicks convertPDF
2. Note calls virtual printer ("Microsoft Print to PDF")
3. User completes SaveFileDialog to save the PDF

[Actor: system]

[Alert]

[Summary] Send SMS / email or toast notification to the user

[Flow of Events]

1. System checks if it is time to remind
2. If it is time to remind:
 - a. System checks what kind of notification to send from metadata (Toast, Email, Phone)
 - b. System sends notification to requested zones
3. Else, system waits and repeats.

2.f. Actors

[User] The person using the system.

[System] The device the user is using.

2.g. Use Case Model

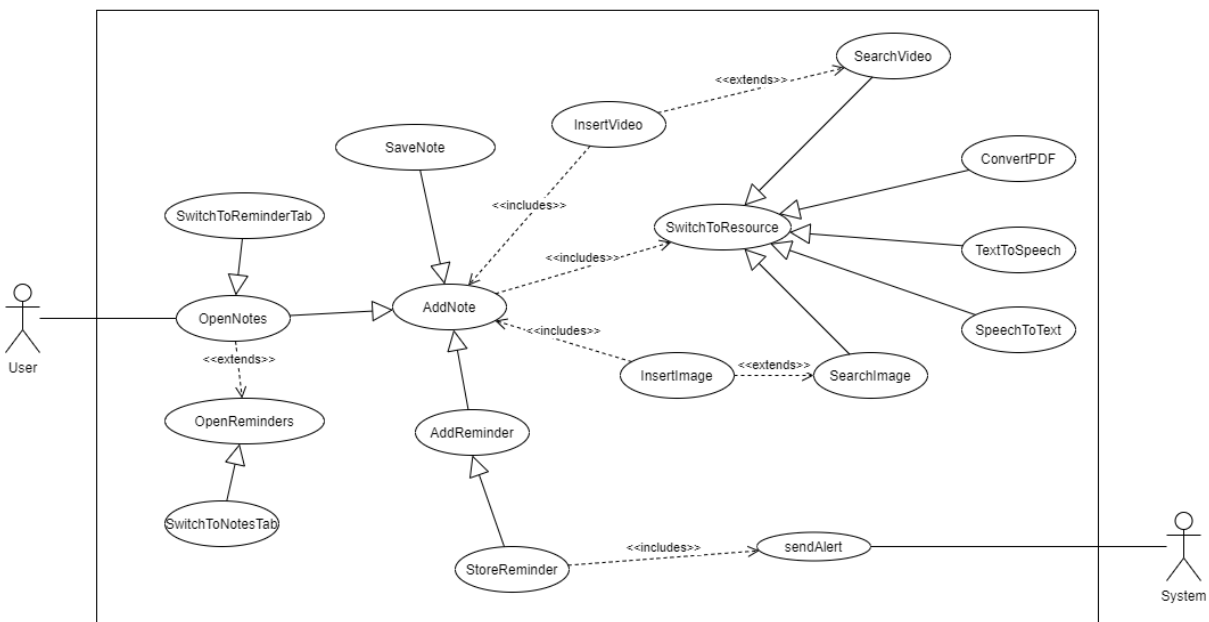


Figure 2.g.i: Use Case Diagram for proposed functionality of Better Notes

2.h. User Interface

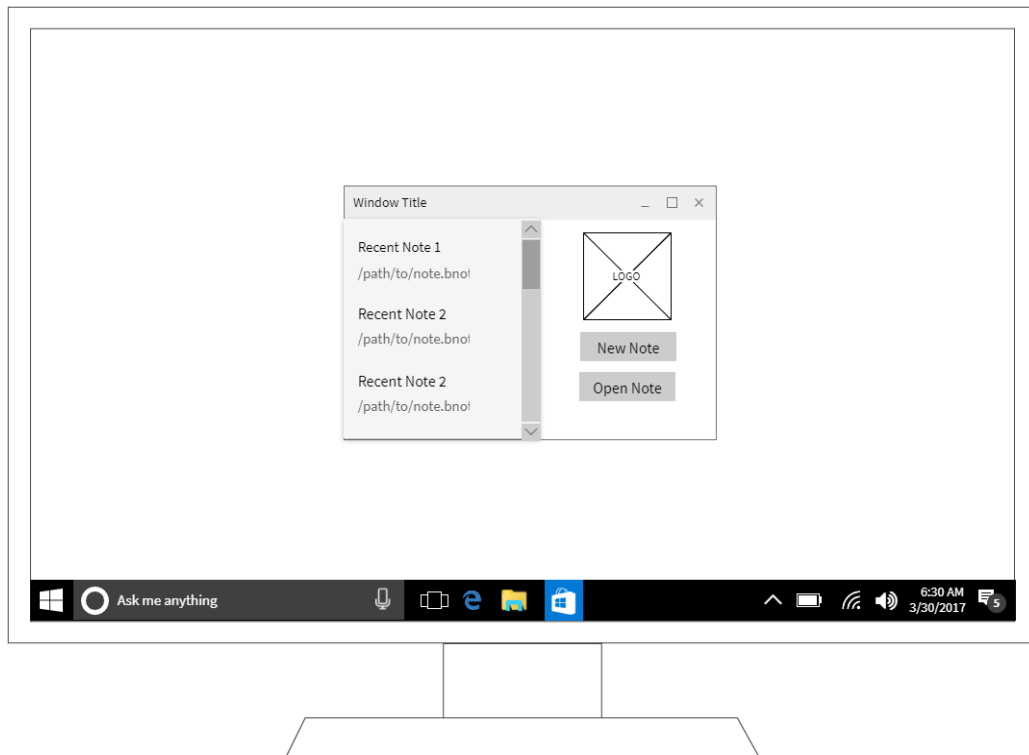


Figure 2.h.i: Open view of Better Notes

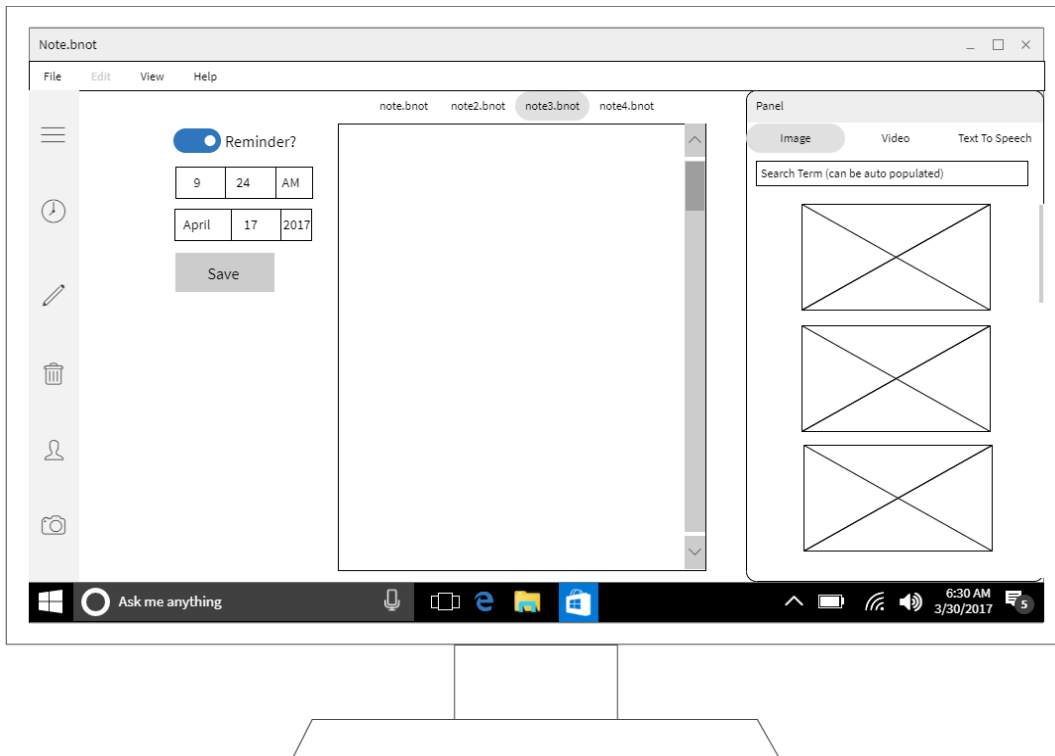


Figure 2.h.ii: Main view of Better Notes

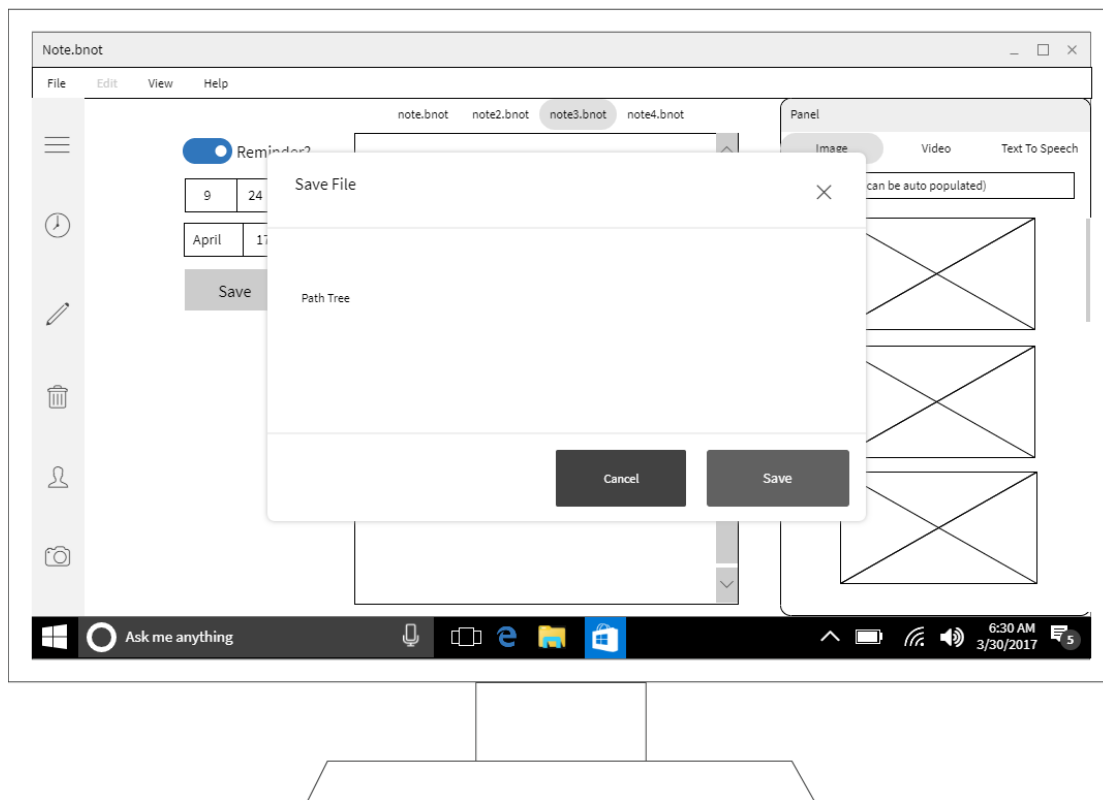


Figure 2.h.iii: Save view of Better Notes (note: open will appear similar and for brevity of the document was excluded)

3. Analysis

3.a. Object Model

3.a.i. Domain Lexicon

Entity Objects

sendAlert
StoreReminder
SwitchToNotesTab
SwitchToReminderTab
SaveNote
StoreReminder
InsertVideo
InsertImage
ConvertPDF
SpeechToText
TextToSpeech

Boundary Objects

OpenNotes
OpenReminder

Control Objects

AddNotes
AddReminder
SwitchToResource
SearchImage
SearchVideo

3.a.ii. Class Diagram

The Following class diagrams have been split for easy viewing, links between each can be seen by the objects labeled Connector.

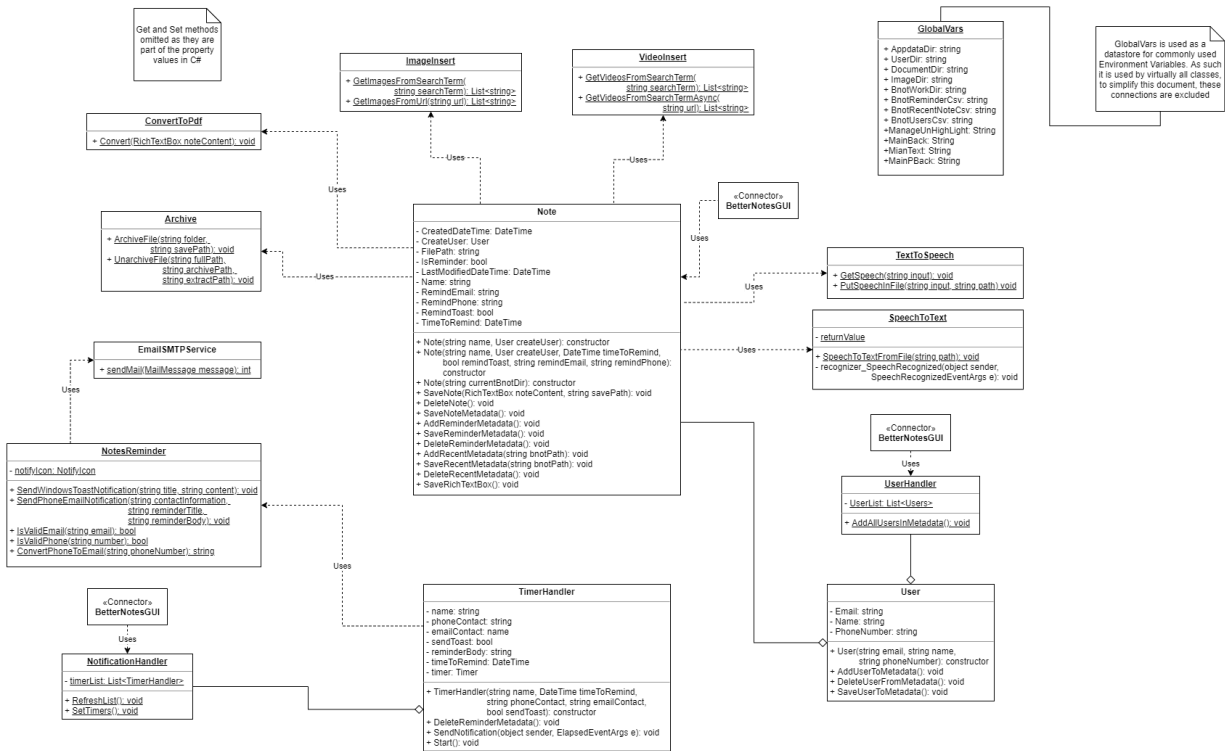


Figure 3.a.ii.1: UML Class Diagram for proposed functionality of BetterNotes

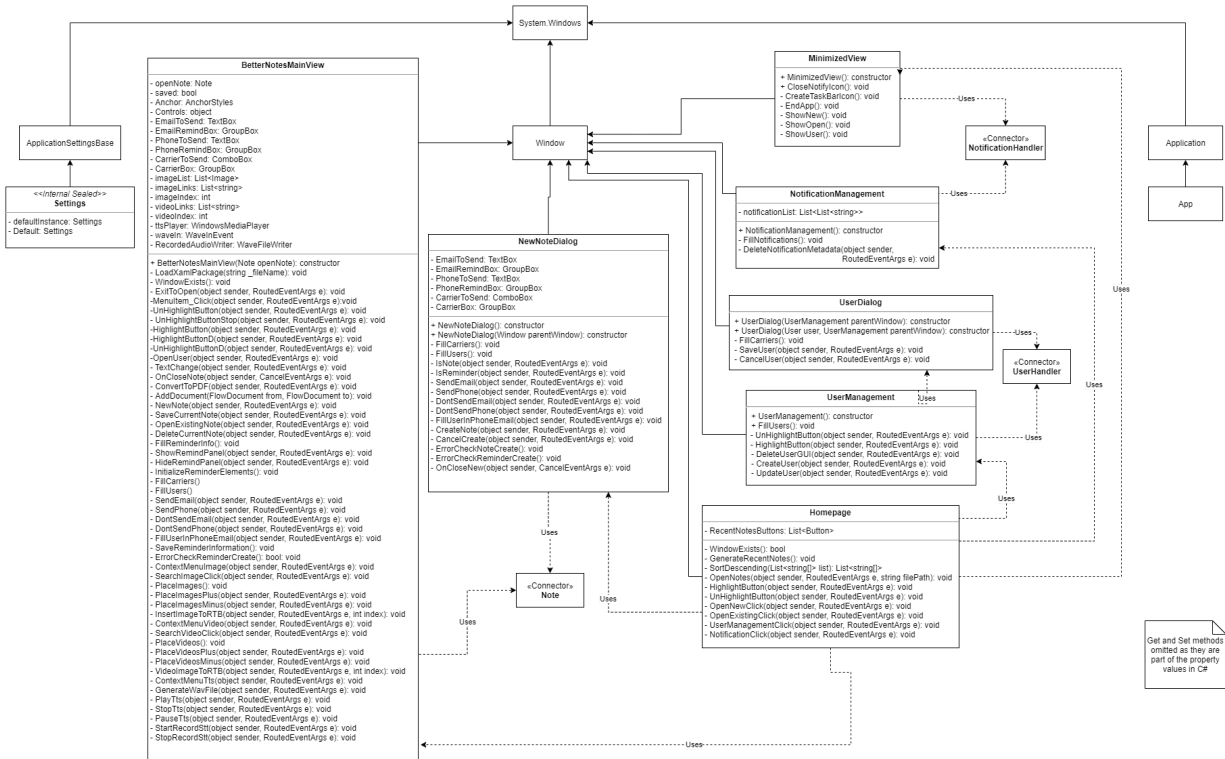


Figure 3.a.ii.2: UML Class Diagram for proposed functionality of BetterNotesGUI

3.b. Dynamic Model

3.b.i. State Chart

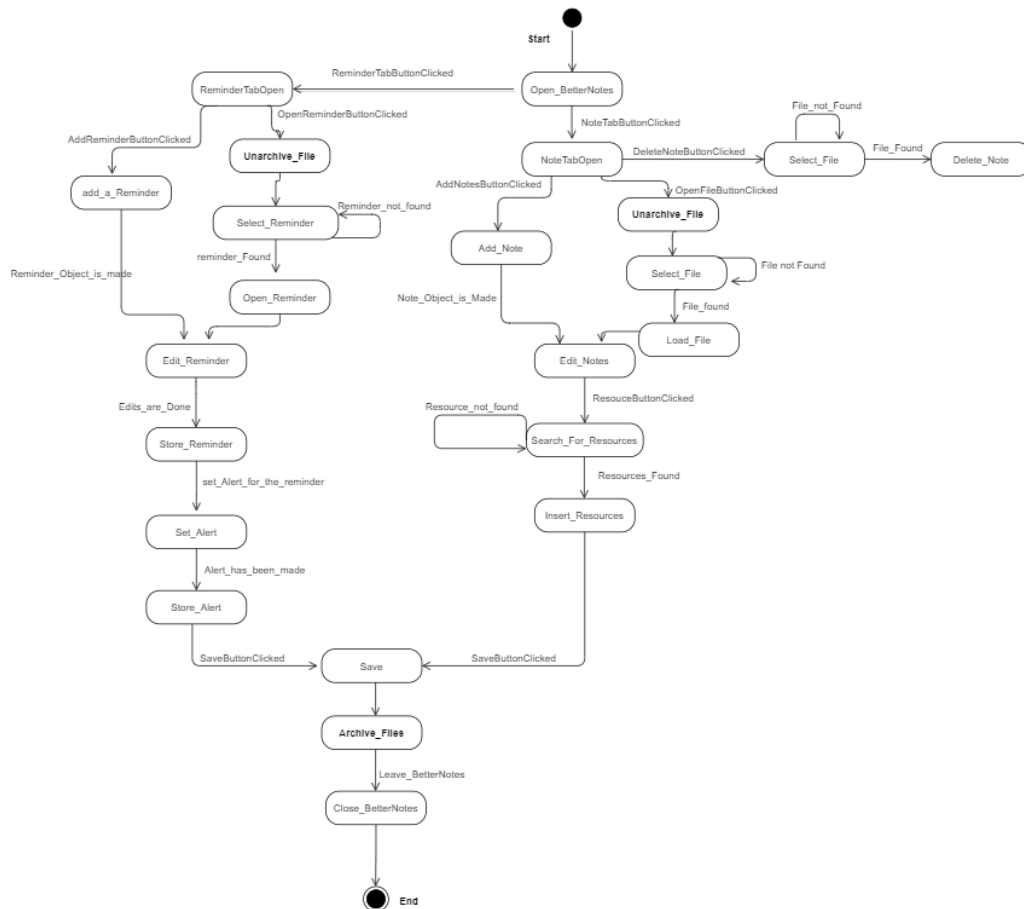


Figure 3.b.i.1: State chart of Better Notes

3.b.ii. Sequence Diagram

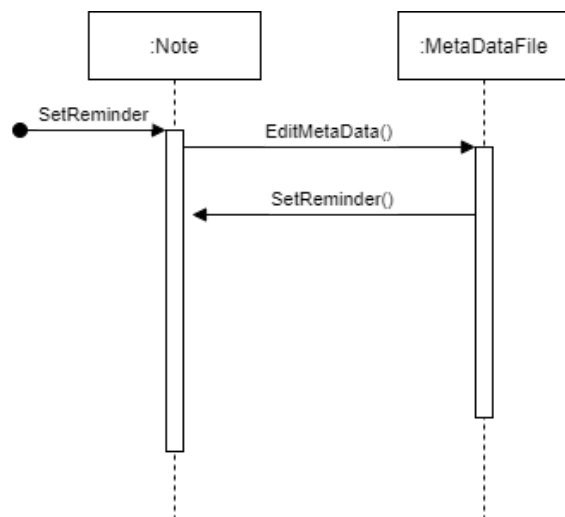


Figure 3.b.ii.1: SetReminder sequence diagram

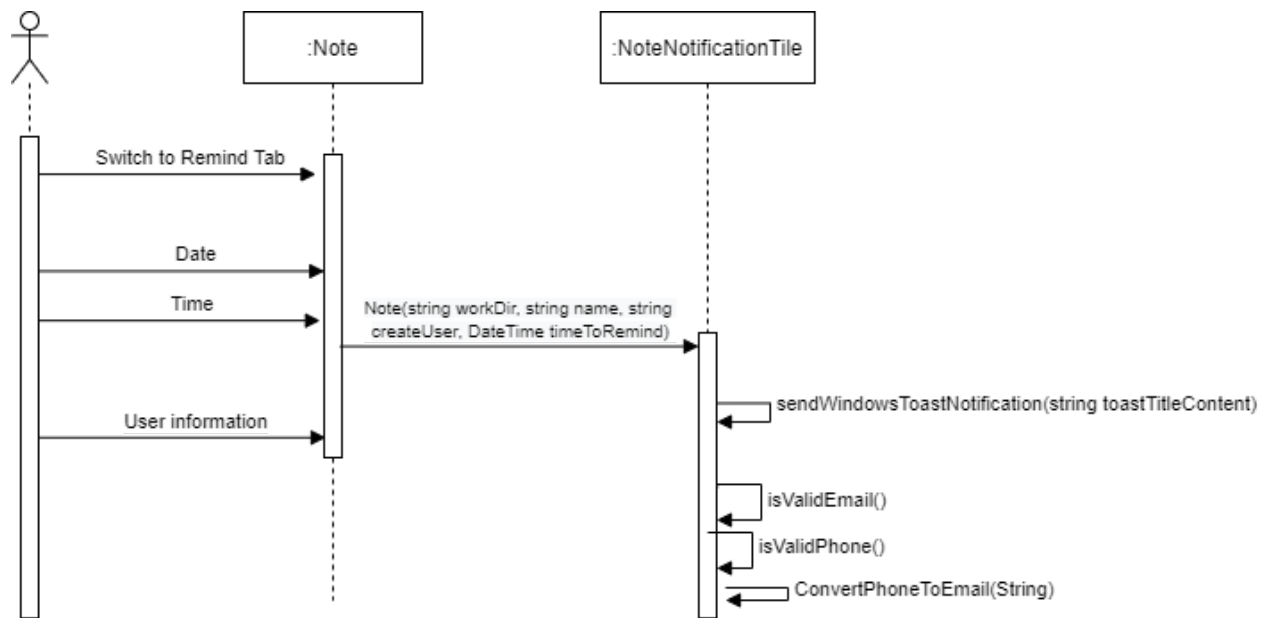


Figure 3.b.ii.2: addReminder sequence diagram

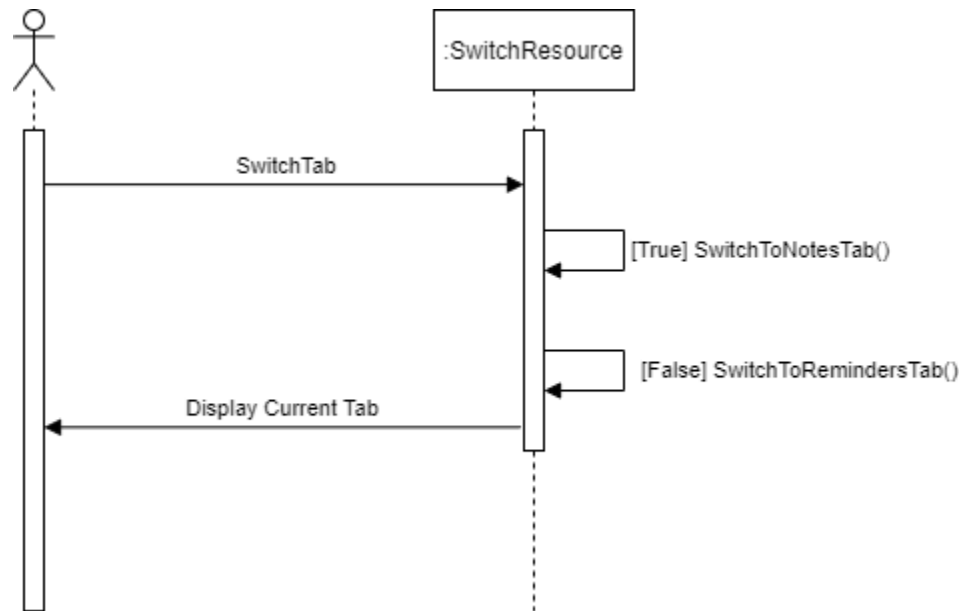


Figure 3.b.ii.3: switchToResourcesTab sequence diagram

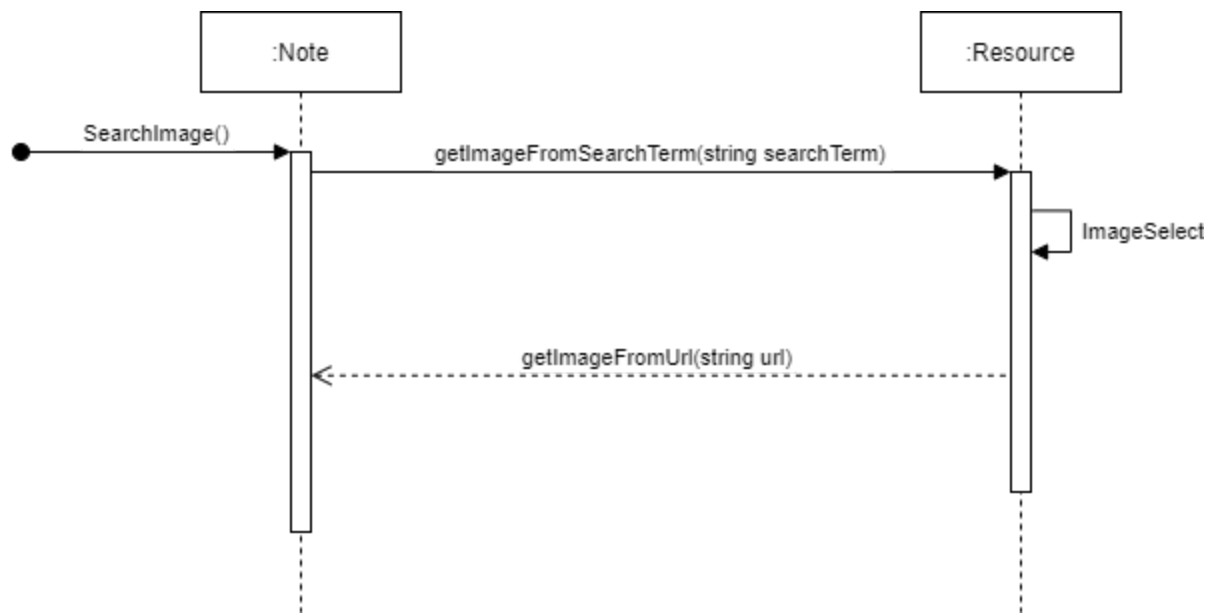


Figure 3.b.ii.4: SearchImage sequence diagram

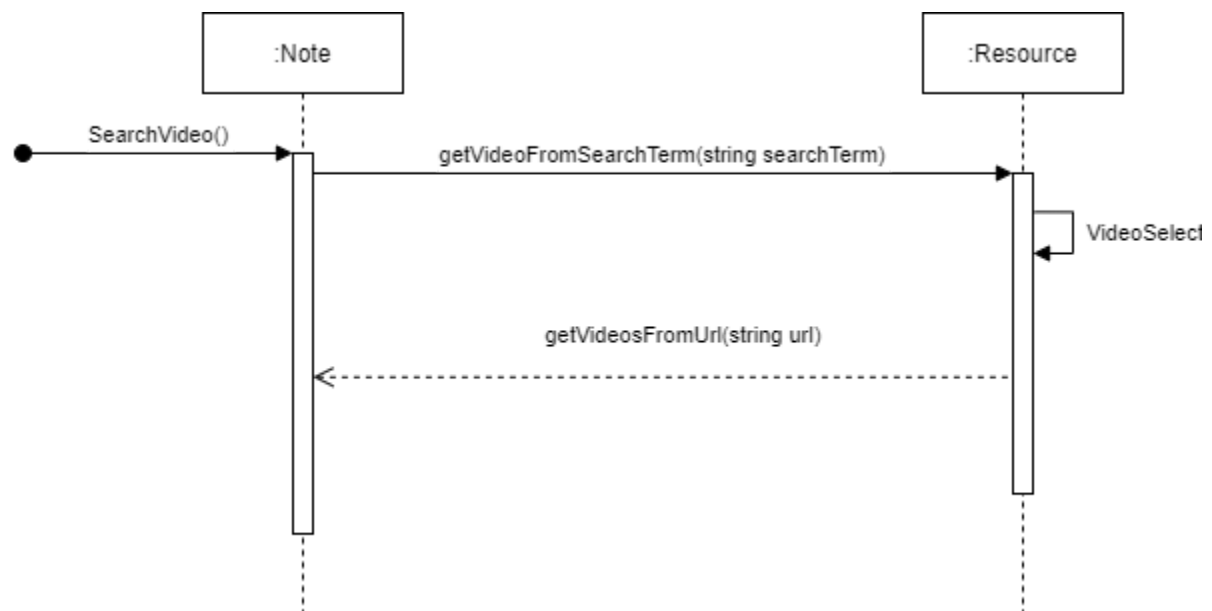


Figure 3.b.ii.5: SearchVideo sequence diagram

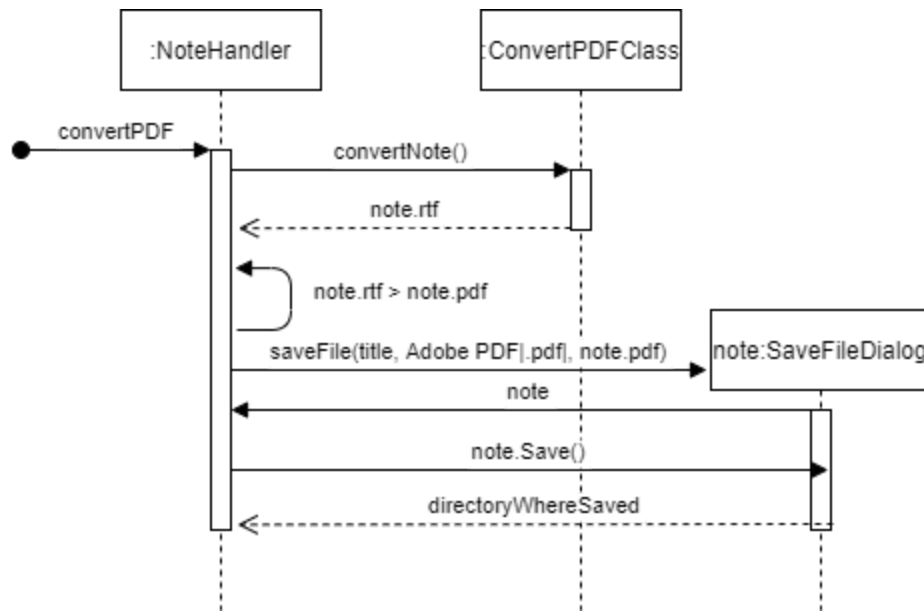


Figure 3.b.ii.6: ConvertPDF sequence diagram

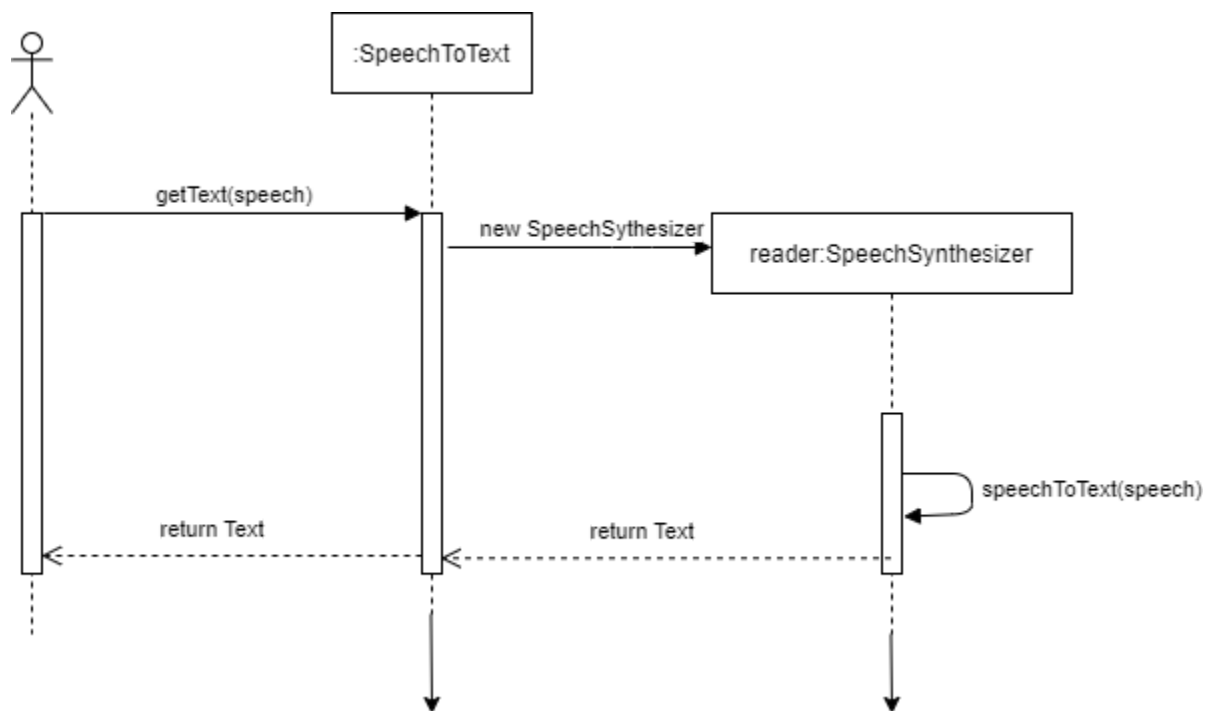


Figure 3.b.ii.7: SpeechToText sequence diagram

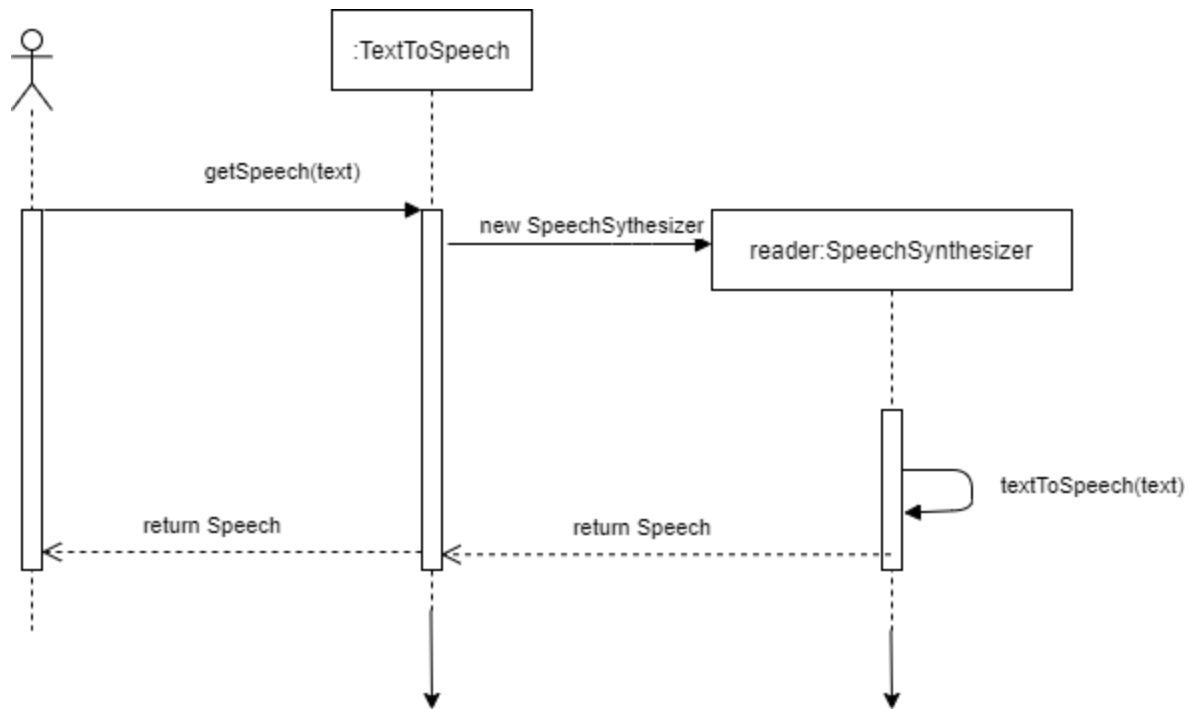


Figure 3.b.ii.8: TextToSpeech sequence diagram

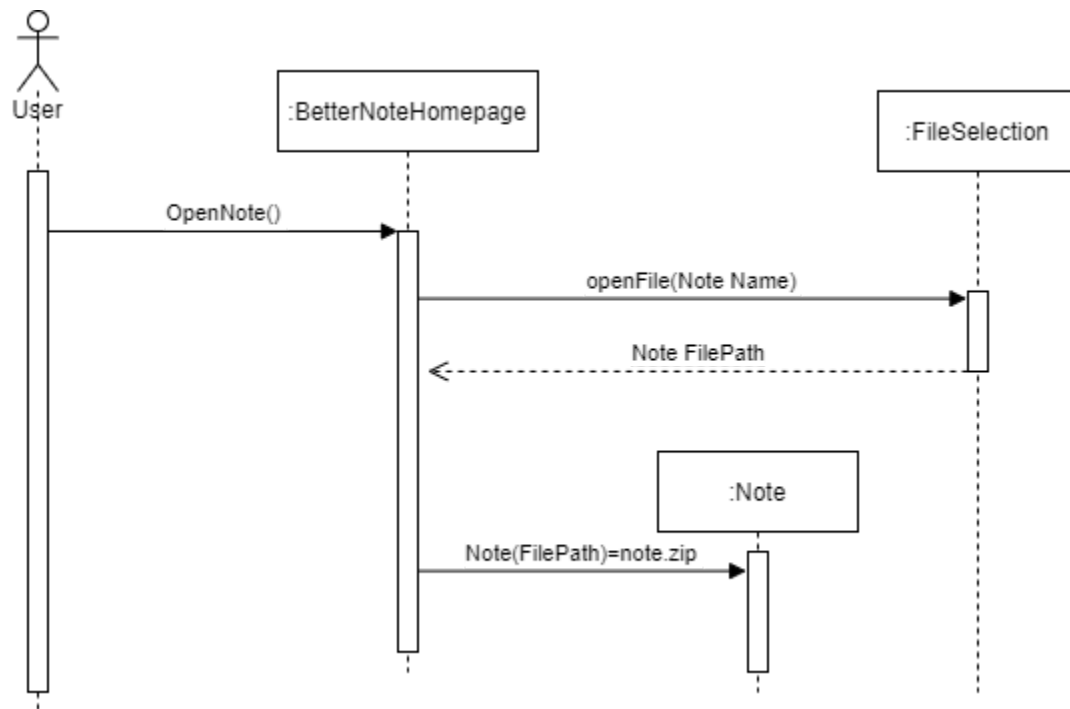


Figure 3.b.ii.9: OpenNote sequence diagram

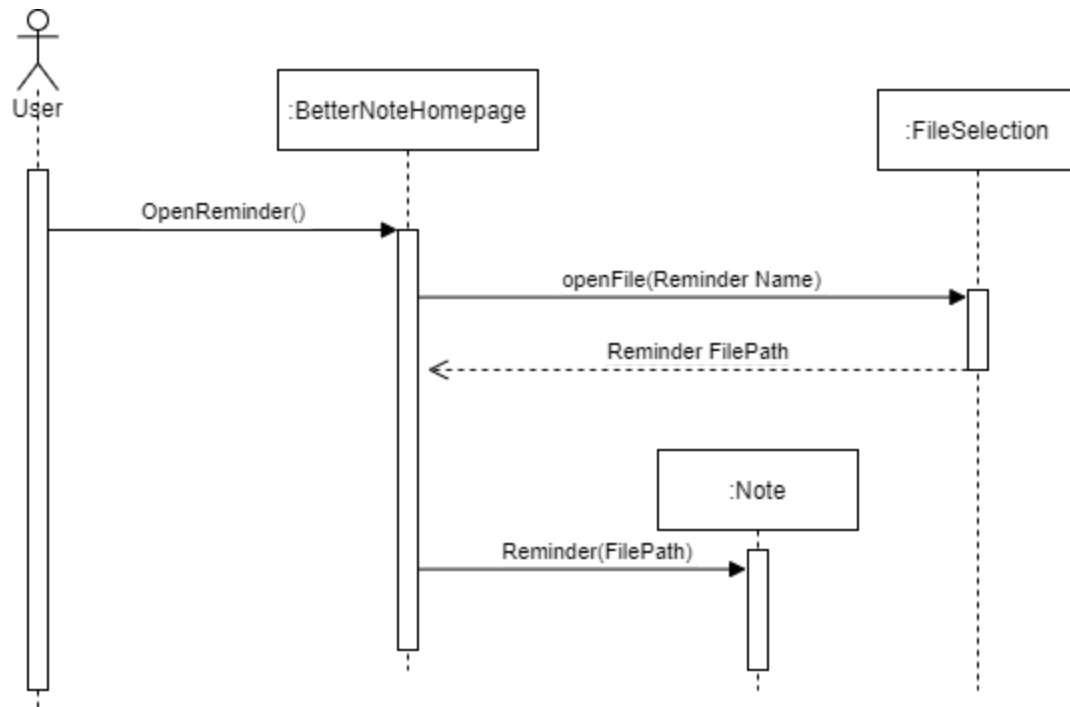


Figure 3.b.ii.10: OpenReminder sequence diagram

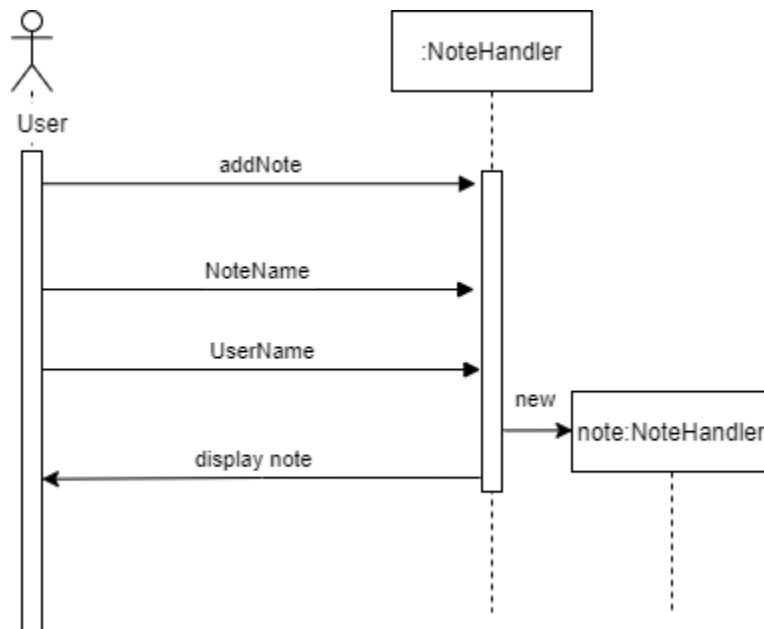


Figure 3.b.ii.11: AddNote sequence diagram

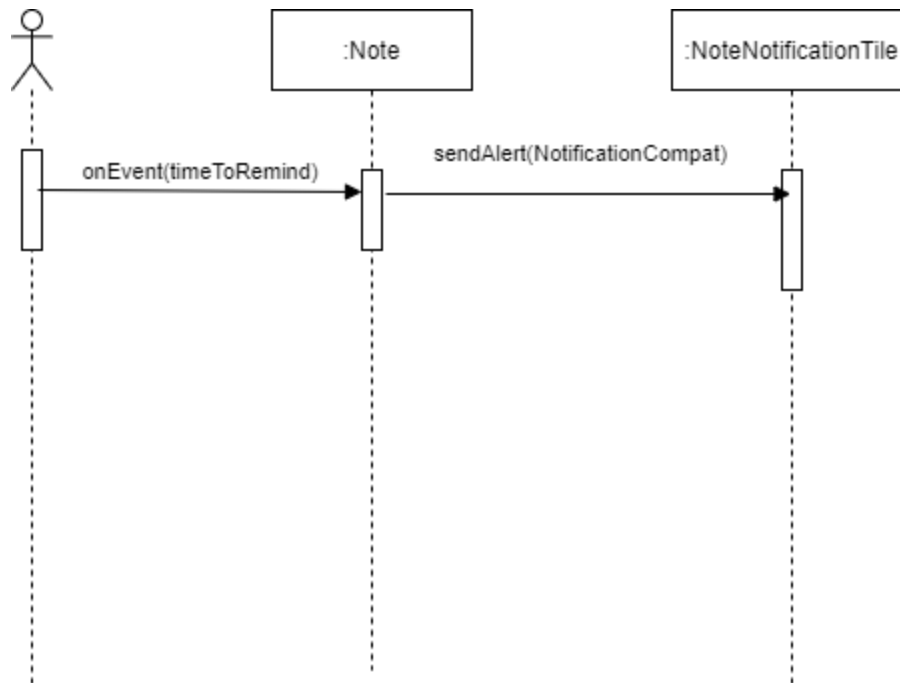


Figure 3.b.ii.12: Alert sequence diagram

4. Conclusions

The overall objective of the BetterNotes project is to provide software in which users with memory difficulties can record information in an easier way and to provide a method to remember that information in a convenient fashion. We will make a software that stores information into a notepad application and can insert the appropriate images that associate with the information given. We also plan to provide a reminder setting for people to set to remind the person that they made the notes in each format as well as a way that will allow users to store these notes in other formats such as PDF. We will also offer a feature that will allow users to use speech to text options for those who have difficulties typing and a text to speech option for those that may struggle to read the included font types. The primary goal is to create an application conducive to simplifying the lives of those that specifically struggle with memory capacity, specifically, those with memory loss issues. The program could provide structure and a “home base” of sorts that can be checked regularly, the program will also be capable of specifically aiding this group by sending reminders (if set by the user) for those who may still be adjusting to checking the program regularly. Overall, implementing the program will require some further research into specific assistive technology, however, as a basis, this project is growing into a program that may actually make a difference in people’s lives.