Plant Care Manager

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TECHNICAL DOCUMENTATION (Phase 4)

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4.1.1 Externally Sourced Code

The borrowed code used in the project are from the encryption, toPDF methods. A theme for the UI was also borrowed.

Encryption methods used in **note class** were borrowed from https://github.com/luke-park/SecureCompatibleEncryptionExamples/blob/master/Java/SCEE.java

toPDF method from **PlantCareManager** was borrowed and adapted from https://www.javatpoint.com/java-create-pdf

FlatIntelliJLaf theme UI was borrowed from https://stackoverflow.com/questions/70898611/how-to-set-flatlaf-light-look-and-feel-in-netbeans-ide-12-6

4.1.2 Explanation of Critical Algorithms

Reading data from textfiles is critical to the operation of the program. The program needs to access data that has been stored in secondary storage. Without access to secondary storage the program will lose a lot of its functionality. The user can't view data that they have saved with the useful information derived from them. The method will pull data from the three text files (Plants.txt, Tasks.txt and EncryptedNotes.txt) and load them into the program in primary memory.

```
void readFromTextFile Method()
Start method
      initialize Plant[] plants
      initialize Task[] tasks
      initialize Note[] notes

      initialize String line
      while line ← readLine from plant textfile does not equal null
      Start while
            String[] parts ← variable line split by the delimiter ;;
            String name ← parts[0]
            String label ← parts[1]
            String note ← parts[2]

            if label equals "empty"
            Start if
                  label ← empty string
            End if

            if note equals "empty"
            Start if
                  note ← empty string
            End if
```

```
      plants ← add Plant(name, note, label) object to plants array
End while

while  ← readLine from task textfile does not equal null
Start while

      String[] parts ← variable line split by the delimiter ;;
      String name ← parts[0]
      String label ← parts[1]
      String note ← parts[2]
      boolean doneOrNote ← parts[3]
      String dueDateString ← parts[4]

      if label equals “empty”
      Start if
            label ← empty string
      End if

      if note equals “empty”
      Start if
            note ← empty string
      End if

      initialize LocalDate dueDate

      if dueDateString equals “empty”
      Start if
            dueDate ← null
      End if
      Start else
            dueDate ← parse dueDateString to LocalDate
      End else

      tasks ← add Task(doneOrNote, dueDate, name, note, label) Object to tasks array
```

```
      End while

      while  ← readLine from task textfile does not equal null
      Start while
            String[] parts ← variable line split by the delimiter ;;
            String noteHeading ← parts[0]
            String encryptedPassword ← parts[1]
            String encryptedContents ← parts[2]

            if encryptedPassword equals "empty"
            Start if
                  encryptedPassword ← empty string
            End if

            if encryptedContents equals "empty"
            Start if
                  encryptedContents ← empty string
            End if

            notes ← add Note(noteHeading, encryptedContent, encryptedPassword) Object to notes array
      End while
End Method
```

4.1.3 Advanced Techniques

Encryption and Decryption via AES.
Externally sourced method that allows for encryption in the program. The methods use AES. AES is a common symmetric encryption algorithm to encrypt data. The methods allow encryption and decryption of the String that is inputted. A string that is encrypted can not be read and is almost impossible to decrypt without the password.

Creating a pdf
Externally sourced method that allows the program to create PDFs. PDFs are one of the most commonly used file types and can be viewed on a large number of devices. A large number of elements can be displayed on a pdf such as images, tables and signatures. This makes it ideal to display all sorts of information. The creation of a pdf in java requires a library like iText or Apache PDFBox. This allows a program to add elements together to create a complete PDF.

Inheritance
Inheritance is used by the Task Class which inherits from the Plant Class. Although the two objects are not logically similar, Task does share the same properties and methods as Plant. This reduces the duplication of code as Task does not duplicate code if the Plant class has the code. Inheritance makes objects related to each other, therefore they can be added to an array that is of type of the parent class.

4.2.1 Evaluation of Solution

The program overall can complete the tasks that it is meant to do. It does store information that the user wants to store and helps manage the information for the user. However, there are a lot of bugs in the program. If a user behaves in an unexpected way the program might crash or not successfully complete a task. The program is also slow in opening some sections like the toPDF screen.

The solution would be below average as the user might not like the number of bugs that the program has. The reliability of the program is also an issue as the bugs might interfere with the data that the program is storing. The bugs can be solved by doing more testing and incorporating better defensive coding techniques when writing the program. The speed of the program can also be improved if threads are used in the program.

4.2.2 Functional Testing:

Tester 1
Name: David Guo
Date: 22 September 2022

Functions	**Working (Y/N)**
Display Help pop-up on Home Page	Y
Details of tasks close to due date displayed on Home Page	Y
Navigation to Plant Manager, Task Manager, Encrypted Notes Manager	Y
Open Help FAQ pop up on Menu	Y
Open Contact developer pop on on Menu	Y
Download a plant list from PDF pop-up accessed from Menu	Y
Download a task list from PDF pop-up accessed from Menu	N
Sync Tasks accessed from Menu (the synced tasks would completed and labels changed to completed)	Y
Saves the program's data on the text file	Y
Add a plant	Y
Change/Edit details about a selected plant	Y
Display a selected plants details	Y
Deletes a selected plant	Y
Sorts the list of plants (Sorting by: "Alphabetically" or "Alphabetically by Labels")	Y
Adds a task	Y
Deletes a selected Task	Y
Displays a selected task	Y
Completes a selected Task	Y
Sorts a list of tasks (Sorting by : "Alphabetically" or "Alphabetically by Labels" or "Due Date"	N
Filter the list of tasks (Predefined labels: "high priority", "medium priority", "low priority" "in pdf")	Y

View Headings of Encrypted Notes	Y
Add a note - default password is (1234)	Y
Unlock note by entering correct password	Y
Content can be viewed when decrypted	Y
Lock the note (note is encrypted with limited functionality)	Y
Delete selected Note (if decrypted)	Y
Edit selected note (if decrypted)	Y
Change password (if decrypted)	Y

Tester 2
Name: David Zhu
Date: 22 September 2022

Functions	**Working (Y/N)**
Display Help pop-up on Home Page	Y
Details of tasks close to due date displayed on Home Page	Y
Navigation to Plant Manager, Task Manager, Encrypted Notes Manager	Y
Open Help FAQ pop up on Menu	Y
Open Contact developer pop on on Menu	Y
Download a plant list from PDF pop-up accessed from Menu - PDF is saved on pdfDownloads folder on the project folder	Y
Download a task list from PDF pop-up accessed from Menu	N
Sync Tasks accessed from Menu (the synced tasks would completed and labels changed to completed)	Y
Saves the program's data on the text file	Y
Add a plant	Y
Change/Edit details about a selected plant	Y
Display a selected plants details	Y
Deletes a selected plant	Y
Sorts the list of plants (Sorting by: "Alphabetically" or "Alphabetically by Labels")	Y
Adds a task	Y
Deletes a selected Task	Y
Displays a selected task	Y
Completes a selected Task	Y
Sorts a list of tasks (Sorting by : "Alphabetically" or "Alphabetically by Labels" or "Due Date"	N
Filter the list of tasks (Predefined labels: "high priority", "medium priority", "low priority" "in pdf")	Y

View Headings of Encrypted Notes	Y
Add a note - the default password is (1234)	Y
Unlock note by entering correct password	Y
Content can be viewed when decrypted	Y
Lock the note (note is encrypted with limited functionality)	Y
Delete selected Note (if decrypted)	Y
Edit selected note (if decrypted)	Y
Change password (if decrypted)	Y

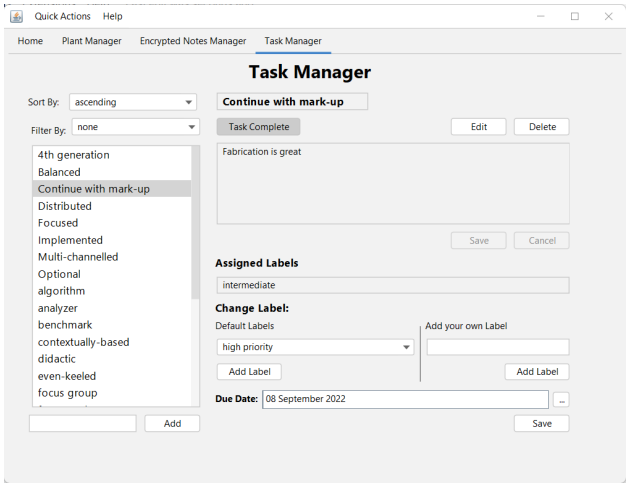
4.2.3 Test Plan and Result

Test Plan:

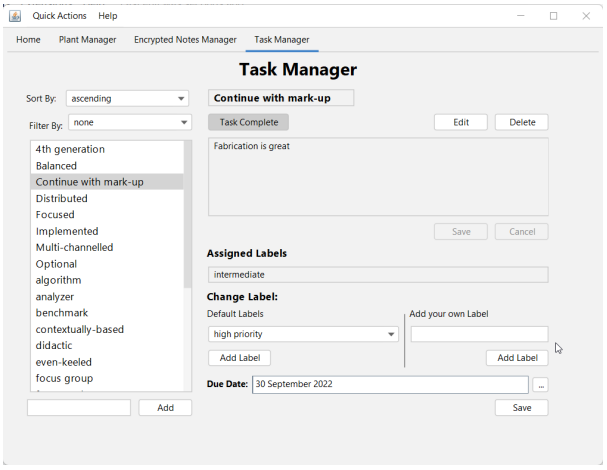
Field / Input Variables	Component	Standard Data	Extreme Data	Abnormal Data
Dates	Due Date of Tasks	30 September 2022	2004/12/01	asdf
String	Add Text file of Plant	Sunflower	1234nzvcl@34kl	↔ ←

Due Date of Tasks

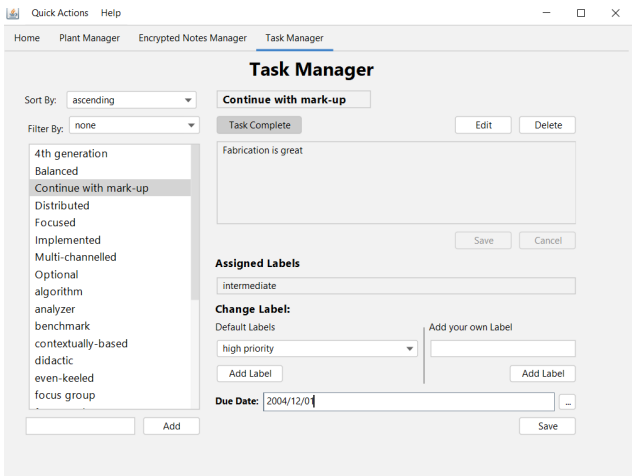
Before



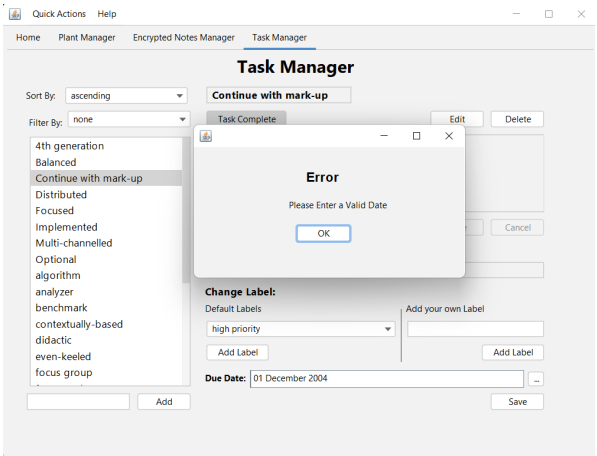
After



Before



After



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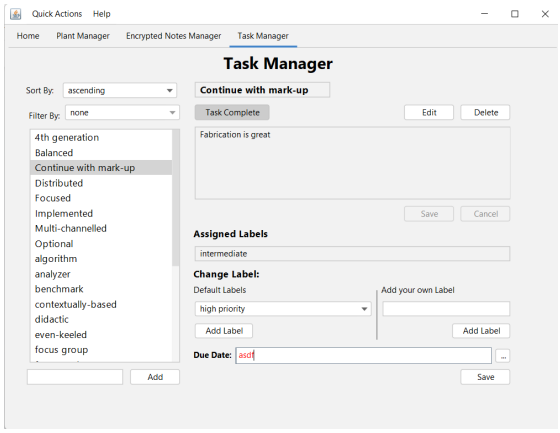
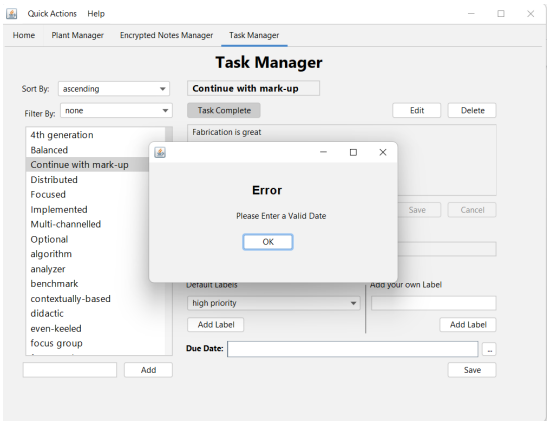
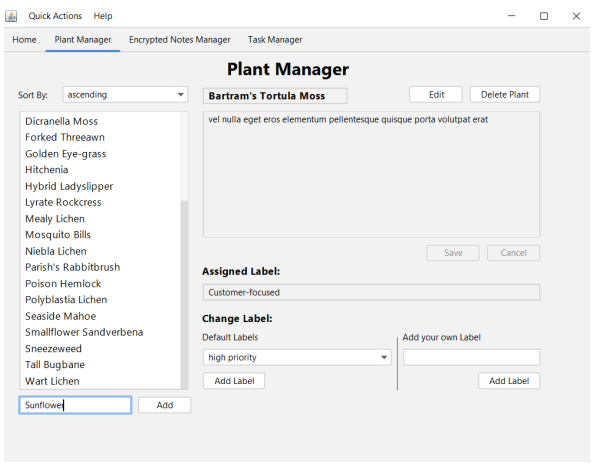


After

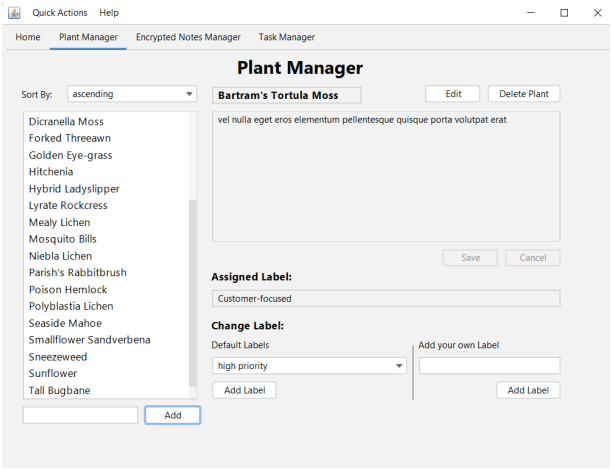


Add Text file of Plant

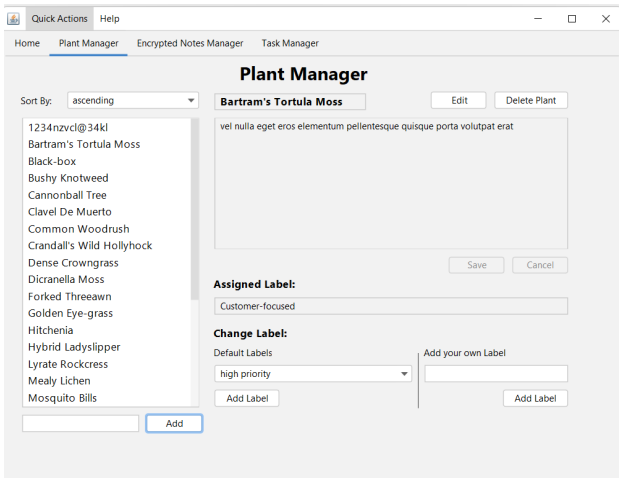
Before



After



Before



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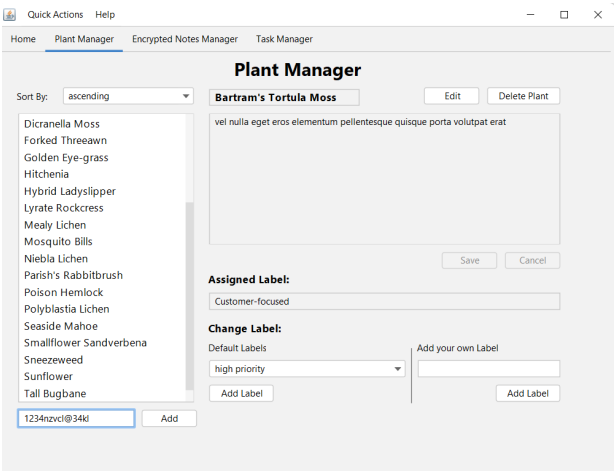
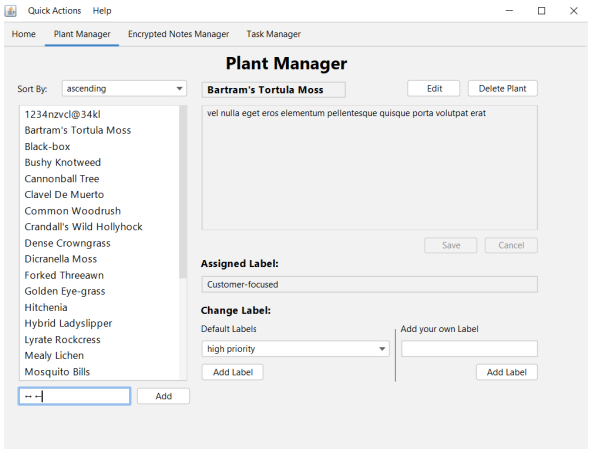
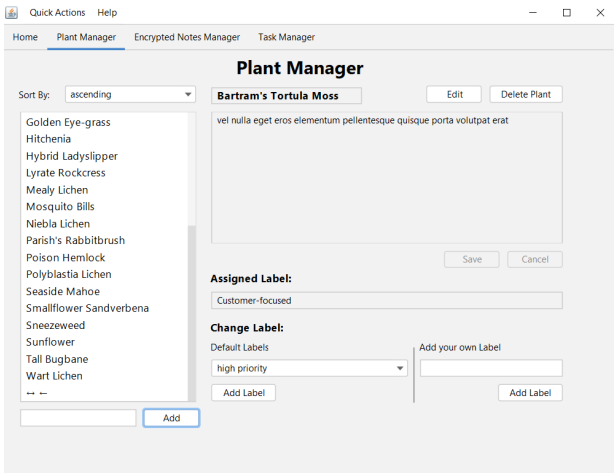


Before



After