Implementation Assignment

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Link: <https://github.com/NoFac3/ERPTeslaSupport/tree/main>

# Implementation Assignment

When the program first starts, the user is prompted with a login ([figure 1A](#_Figure_1A)). From the login frame, the user inputs their username and password then selects the login button. During the initialization for this window, the Login Frame class initiates the startup method from the Query class to access the encryption key from the internal file system so the initial login validation will be able to work, since the database is encrypted. Once the user logs in, their login is passed to the account query class which encrypts and validates the user credentials with others in the database. If there is not a match, the program returns a message window ([figure 1B](#_Figure_1B)) that lets the user know that their login was invalid. If the user forgets their password, they can select the forgotten password button, as seen in [figure 1C](#_Figure_1C). If the username is correct, then a message will be sent to their department manager, and they see a confirmation message ([figure 1D](#_Figure_1D)). From the forgotten password window, if the user does not know their username and password, they can select the forgotten username button. The forgotten username window will appear ([figure 1E](#_Figure_1E)) and requires the user to enter their first name, last name, and department. The user's credentials will be passed to the account query class, encrypted, and then verified to determine if this is a real user. Once validated, the program will search for the manager of the selected department and initialize an account request message. Once complete the user will receive a confirmation message ([figure 1F](#_Figure_1F)).

## Account Internal Frames

Upon successful login validation, the Login Frame class will get the users profile information and permissions. From the Boolean permission values. The Enterprise Resource Program (ERP) main window will initialize the associated internal desktop panes that will be housed in a desktop pane. For all users, the program will display a calendar pane, seen in [figure 2A,](#_Figure_2A) and a message pane, seen in [figure 3A](#_Figure_3A). The calendar pane title displays the current date, which is generated from the Chronology class. Each day of the month is generated dynamically into an array relative to their perspective day offsets based on the Gregorian calendar. The program determines the current day of the month and adds a star character next to the array value that equals the current day of the month. This array is then combined into a default table model and then added to the main table in the calendar pane. From the messages pane ([figure 3A](#_Figure_3A)), there is a table that displays the message number, whether the message has been read, the message type, the sender, receiver, the perspective dates, and the subject. By default, the pane displays messages that are received, but can be changed via the combo box in the upper right corner to send, which will dynamically display all messages sent by the user. When the user selects the button with the refresh icon, the message table will update. When the user selects the button with the plus icon, the program will display a new message frame, seen in [figure 3B](#_Figure_3B). From this window, if the user does not know the username of the intended receiver, they can select the search button which will display the message search pane, seen in [figure 3C](#_Figure_3C). The user can enter the name of the user and the program will search for a match. Once the user selects a row [figure 3D](#_Figure_3D), the window will close and populate the To text area with the selected username, seen in [figure 3E](#_Figure_3E). The message frame also provides several options for the message type ([figure 3F](#_Figure_3F)) and the approval status for request messages ([figure 3G](#_Figure_3G)). This approval functions and labels are only editable by users with manager or administrator permissions. The next portion of the message frame is the subject, thread, and the final buttons to quit, closing the frame, or send the message, seen in [figure 3H](#_Figure_3H). After inputting the subject and the message text, the user selects the send button. The message box is cleared and the new message is inserted into the thread box, along with the database, with a familiar messaging format like an email thread, seen in [figure 3I](#_Figure_3I). This formatting was mad possible using an editor pane that employs text and html formatting.

For users with tech permissions, the program will additionally display a ticket pane and a guide frame, seen in [figure 4A](#_Figure_4A). The tech support pane ([figure 4B](#_Figure_4B))contains a tickets table and two buttons for refreshing the table, with a refresh icon, and a button with a plus icon for creating new tickets, seen in [figure 4C](#_Figure_4C). Selecting the plus button opens a new ticket window ([figure 4D](#_Figure_4D)) to which the program automatically generates the new ticket number, seen in [figure 4E](#_Figure_4E). To determine the new ticket number, the program executes a query that counts the total rows in the ticket database table then returns the total count plus one. The ticket window contains a section with three tabs. The first tab is for inputting customer information. The user enters the first name, last name, phone number, and email of the customer ([figure 4F](#_Figure_4F)). Once entered they can search to see if they are an existing customer. If the customer is not in the database, the program will output a message of the null query results ([figure 4G](#_Figure_4G)). If the user inputs and searches for an existing customer ([figure 4H](#_Figure_4H)), the program will populate the lower table with the customers matching the search, seen in [figure 4I](#_Figure_4I). The search query is more general, so the user does not have to include a value for all customer information. The user will then fill out the rest of the ticket including the title, priority, department assignment, status, and description. Once the user selects the create button, the ticket information is encrypted, then inserted into the database. When selecting a an already created ticket from the tech support internal pane ticket table ([figure 4J](#_Figure_4J)) , the program displays a ticket frame with the corresponding ticket information, seen in [figure 4K](#_Figure_4K). From the three tabs, the status and log tables become useful for viewing existing tickets. The ticket status pane, seen in [figure 4L](#_Figure_4L), show the ticket number, customer name, status, priority, and assignment of the ticket. This is also seen in the customer information tab and the lower portion of the ticket, so this tab will become useful for reverting changes to the different ticket fields. The Log tab, seen in [figure 4M](#_Figure_4M), contains a table for when the ticket was opened, last edited, and closed with the user who performed the action.

For users with analyst permissions, the program will display the default calendar and message panes in addition to three data table panes, seen in [figure 5A](#_Figure_5A). The first table shows a table containing the vehicle inventory. The second table contains a table for incidents where tesla customers experienced sudden acceleration. The third table contains a table of vehicle issues and accidents that subsequently lead to death.

For users with engineer permissions, the program will display the calendar and message panes in addition to the tech support pane, analyst pane, and the engineer pane, seen in [figure 6A](#_Figure_6A). The engineer frame is a guide search system ([figure 6B](#_Figure_6B)). The pane contains an edit menu, an error code search area, a search button, and an editor pane that, on startup, displays all guides from the database with a text/html formatting. The edit menu ([figure 6C](#_Figure_6C)) is not visible to users that do not have engineering permissions. From the edit menu ([figure 6D](#_Figure_6D)) users with engineering permissions can select to add a new guide ([figure 6E](#_Figure_6E)), which will display a new guide window, seen in [figure 6F](#_Figure_6F). This window contains a text field for the error code and text areas for the code name, meaning and trouble shooting steps. [Figure 6G](#_Figure_6G) show an example input for a new guide. Once created, the user can search for the guide, seen in [figure 6H](#_Figure_6H).

When the user selects the edit guide button from the edit menu ([figure 6I](#_Figure_6I)), the program will search for the guide using the text area with the label "Enter Error Code". If this field is blank, the program will display an error message. With the error code entered([figure 6J](#_Figure_6J)), the engineer can select the edit guide menu item and the program will output the same guide frame for adding new guides, but with the information populated to the text areas, seen in [figure 6K](#_Figure_6K). For general searches, the user inputs the error code into the search bar and selected the search button. The program will encrypt the code and query the database for a match. The matching information will be encrypted, then formatted in html and displayed on the editor pane, shown in [figure 6L](#_Figure_6L). There is a specific formatting in how the error codes are written, but the program compensates for this by adding an additional conversion method that allows additional ways of typing in the same code, shown in [figure 6M](#_Figure_6M), where the user inputted the code in all lowercase without the underscore. If the code does not exist, the program will display an error message in the editor pane, shown in [figure 6N](#_Figure_6N).

For users that have manager permissions, the program will display the ticket log pane in addition to the tech support, engineer, messages, and calendar panes, seen in [figure 7A](#_Figure_7A). The manager pane, shown in [figure 7B](#_Figure_7B), contains four tables for daily, weekly, monthly, and yearly tickets with each table sectioned into assigned, closed, and open. From the manager account in the ticket support pane ([figure 7C](#_Figure_7C)), the manager can select from the ticket menu, shown in ([figure 7D](#_Figure_7D)). The manager has several options to select from including creating, editing, searching, closing, and locking tickets. For example, when selecting the find ticket option, the program displays a ticket search frame ([figure 7E](#_Figure_7E)), which will open the corresponding ticket number in a ticket frame ([figure 7F](#_Figure_7F)). From the ticket menu in the upper right corner, the manager can select to delete, toggle editing mode, and lock the ticket. If they select the edit mode, the menu label will change to "Exit Editing Mode", shown in [figure 7G](#_Figure_7G). This will also change the features in the ticket window including unlocking all text areas, combo boxes, and display the update button. The manager and all user that have access to the ticket can now edit the ticket. For example, if the manager updates information on the ticket, shown in [figure 7H](#_Figure_7H), after selecting update, the program will update the ticket database and display a successful update message ([figure 7I](#_Figure_7I)). Returning to the internal ticketing frame, the updated status, closed date, and title can been seen ([figure 7J](#_Figure_7J)).

For user that have admin permissions, the program will display the calendar, messages, logs, tech support, and guide panes in addition to the user accounts pane, seen in [figure 8A](#_Figure_8A). [Figure 8B](#_Figure_8B) show the user accounts internal pane with a table of user accounts. This table, in addition to all tables in the application, has the default option to sort the table via selecting the column headers. When selected, the column color changes from gray to blue with an arrow indicating ascending ([figure 8C](#_Figure_8C)) or descending order. Additionally there are radio buttons to filter the table for users that have the specific permissions selected. The top combo boxes offer additional filters for the date the account was created, their department, and user type. In the upper left corner of the pane, there are two menus for different application functions and settings. The first is the file menu ([figure 8D](#_Figure_8D)) where the user can refresh the table, reset filters, and change the default password. The refresh item updates the table, while the reset filter removes the set filters, then updates the table. When selecting the change default password item, the program opens the change default password frame, shown in [figure 8E](#_Figure_8E), enabling the admin to change the default password for all new users and users needing a password reset. From the application settings the program displays a new frame with two tables for editing the application time out ([figure 8F](#_Figure_8F)) and changing the database encryption key ([figure 8G](#_Figure_8G)). The new time out values will then be encrypted and changed in the database. For changes the encryption key, the program will decrypt the database, change the encryption key, then update the database with the new values. Returning to the admin frame, in the upper right corner, is a new user button ([figure 8H](#_Figure_8H)). [Figure 8I](#_Figure_8I) show the user account framed open the new user button is selected. This frame contains fields for current date, first name, last name, type, department, account privileges, username, and password. [Figure 8J](#_Figure_8J) shows an example entry for a new user account. Once the first and last name fields are entered, the admin can select the generate button under the username which auto fills a unique username for the new account, show in [figure 8K](#_Figure_8K). The program takes the first letter of the first name and combines it with the last name, all in lower case, for the base of the username. Then the program queries the database for all users with a matching base username, then finds the larges number. This value, plus one, is combined to make the new unique ID. If the user is the first account with the base username, the program will add a "1" to the end of the base. The generate button under the password field performs the similar autofill function ([figure 8L](#_Figure_8L)) but is based on the current default password. Selecting the create user button causes the program to take, encrypt, and insert the new account into the database. Upon successful operation, the program will output a message window indication the account was created, show in [figure 8M](#_Figure_8M). Returning to the user accounts table, the new account can be seen ([figure 8N](#_Figure_8N)). Selecting on the new user will open the existing user window, which is the same as the new user, but an update and a delete button is added to the bottom of the frame with the create user button hidden. The date field in both the new and existing account is locked by default, being that it is autogenerated. However, there is a custom date toggle button that enables the admin to change the date, shown in [figure 8O](#_Figure_8O). [Figure 8P](#_Figure_8P) shows an example of changing user account information. The user's department is changed to Engineering and account privileges for admin and manager are removed. After saving the changes by selecting the update user button, the program updates the user profile with the new information and displays a successful update message ([figure 8Q](#_Figure_8Q)). Returning to the user accounts table, the changes to the user's account are reflected in the table, shown in [figure 8R](#_Figure_8R). The admin account also can delete an existing user. In the user account frame, in the lower left corner is a delete button. When selected, the program deletes the account and displays a successful deletion message ([figure 8S](#_Figure_8S)). Returning to the account table, the user account is no longer in the table, shown in [figure 8T](#_Figure_8T).

## Layout

The program offers several features for the layout of the internal frames. With the inherited features of internal frames, the user can move and resize the windows. After moving the frames around ([figure 9A](#_Figure_9A)), the user can select the reset layout button from the layout menu ([figure 9B](#_Figure_9B)) which causes the program to reorganize the frames, shown in [figure 9C](#_Figure_9C). The program also offers an adaptive resolution feature that dynamically changes the size and position of the internal frames based on the size of the desktop pane. [Figure 9D](#_Figure_9D) shows the program window shrunken down while [figure 9E](#_Figure_9E) shows the window maximized. Another inherited feature of internal frames is the ability to maximize and minimize the frame, shown in [figure 9F](#_Figure_9F), in the upper right corner of the internal frame. When selecting maximize, the interframe fills the entire desktop pane. Selecting the minimize button compresses the window and sends it to the lower left corner ([figure 9G](#_Figure_9G)). The user can select the minimize button again, no highlighted orange, and the frame will return to its position prior to minimization.

# Figures

## Figure 1A

A screenshot of a computer login screen

Description automatically generated with medium confidence

## Figure 1B

A screenshot of a computer

Description automatically generated

## Figure 1C

A screenshot of a computer

Description automatically generated

## Figure 1D

A screenshot of a computer screen

Description automatically generated with medium confidence

## Figure 1E

A screenshot of a computer screen

Description automatically generated with medium confidence

## Figure 1F

A screenshot of a computer screen

Description automatically generated with medium confidence

## Figure 2A

A screenshot of a calendar

Description automatically generated

## Figure 3A

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 3B

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 3C

A screenshot of a computer

Description automatically generated

## Figure 3D

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 3E

A picture containing text, software, screenshot

Description automatically generated

## Figure 3F

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 3G

A screenshot of a computer

Description automatically generated with low confidence

## Figure 3H

A screenshot of a computer

Description automatically generated

## Figure 3I

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 4A

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 4B

A screen shot of a computer

Description automatically generated with medium confidence

## Figure 4C

A screenshot of a computer

Description automatically generated

## Figure 4D

A screenshot of a computer

Description automatically generated

## Figure 4E

A screenshot of a computer

Description automatically generated

## Figure 4F

A screenshot of a computer

Description automatically generated with low confidence

## Figure 4G

A screenshot of a computer error

Description automatically generated with medium confidence

## Figure 4H

A picture containing text, screenshot, display, number

Description automatically generated

## Figure 4I

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 4J

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 4K

A screenshot of a computer

Description automatically generated

## Figure 4L

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 4M

A close-up of a window

Description automatically generated with low confidence

## Figure 5A

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6A

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6B

A screenshot of a computer

Description automatically generated

## Figure 6C

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6D

A screenshot of a computer

Description automatically generated with low confidence

## Figure 6E

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6F

A screenshot of a computer

Description automatically generated

## Figure 6G

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6H

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6I

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6J

A screenshot of a computer

Description automatically generated with low confidence

## Figure 6K

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6L

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 6M

A screenshot of a computer

Description automatically generated with low confidence

## Figure 6N

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 7A

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 7B

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 7C

A screen shot of a computer

Description automatically generated with low confidence

## Figure 7D

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 7E

A screenshot of a computer screen

Description automatically generated with low confidence

## Figure 7F

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 7E

A screen shot of a computer

Description automatically generated with medium confidence

## Figure 7G

A screen shot of a computer

Description automatically generated with medium confidence

## Figure 7H

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 7I

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 7J

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 8A

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 8B

A screenshot of a computer

Description automatically generated

## Figure 8C

A screenshot of a computer

Description automatically generated

## Figure 8D

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 8E

A screenshot of a computer screen

Description automatically generated with medium confidence

## Figure 8F

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 8G

A screenshot of a computer

Description automatically generated

## Figure 8H

A screenshot of a computer

Description automatically generated with low confidence

## Figure 8I

A screenshot of a computer

Description automatically generated

## Figure 8J

A screenshot of a computer

Description automatically generated

## Figure 8K

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 8L

A screenshot of a login box

Description automatically generated with medium confidence

## Figure 8M

A screenshot of a computer

Description automatically generated

## Figure 8N

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 8O

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 8P

A screenshot of a computer

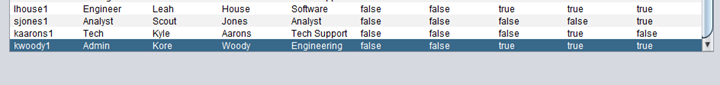
Description automatically generated

## Figure 8Q

A screenshot of a computer

Description automatically generated

## Figure 8R

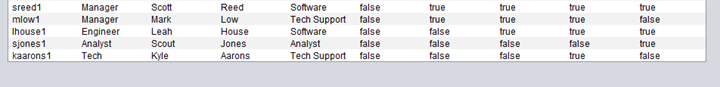


## Figure 8S

A screenshot of a computer

Description automatically generated

## Figure 8T



## Figure 9A

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 9B

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 9C

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 9D

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 9E

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 9F

A screenshot of a computer

Description automatically generated with medium confidence

## Figure 9G

A picture containing screenshot, design

Description automatically generated