**Summary:**

* Create a login form
  + Determines user location
  + Localization for user’s language and one other language
* Database
  + Customer records
    - Add, update, delete
    - Name, address, phone number
  + Appointments
    - Add, update, delete
    - Type of appointment
    - Link to specific customer record
* Calendar
  + View by month and week
  + Ability to automatically adjust appointment times based on user time zones and daylight savings
* Exception control (=/= exception handling)
  + Use at least two different customized mechanisms
  + Exceptions caused by the following
    - Scheduling an appointment outside business hours
    - Scheduling overlapping appointments
    - Entering nonexistent or invalid customer data
    - Entering an incorrect username and password
* Lambda expressions
  + Write **two** or more lambda expressions to make your program more efficient
  + Justify the use of each lambda expression with an in-line comment
* Alerts
  + Provide reminders and alerts 15 minutes before an appointment
  + Based on the user’s login (within 15 minutes of user login)
* Reports
  + Using the collection classes generate the following reports
    - Number of appointment types by month
    - The schedule for each consultant
    - One additional report of your choice
      * Number of appointments by consultant by month
* Logs
  + Recording timestamps for user logins
  + In a .txt file using collection classes
  + Each record should be appended to the log file, if it exists

**Learning points:**

Login form/user authentication

Location –to determine language and time zone

Localization/Globalization

Database

Exception handling

Lambda

Alerts/notifications

Reports

Collections classes

Log to external file

**Full requirements:**

* Front end
  + Login form
    - Username and password input
    - Submit button
      * Successful login closes form and continues to calendar view
        + Display alert if any appointments are within 15 minutes of current (login) time
      * Unsuccessful login attempt displays localized error message
  + Alerts
    - Warning box with customer name and time
    - Ok button
  + Calendar view
    - Month/week view switcher
    - Adjust for time zones and daylight savings switcher
    - Month view
      * Calendar
        + Navigation buttons to adjacent months
      * Appointment labels on corresponding days
        + Clicking the label opens a panel with full details

Name of customer, start time-end time, type

* + - Week view
      * Seven section, each corresponding to a day of the week
        + Each section lists the appointments for that day
        + Name of customer, start time-end time, type
  + Database view
    - Gridview of database table
    - Add, Modify, and Delete buttons
      * Buttons open new form corresponding to button action
        + Customer form

Name

Address int (search bar?)

* + - * + Appointment form

Customer int (search bar?)

Type

Start datetime

End datetime

* + Reports
    - New form that has a button for each report type
    - Prints out formatted output to new form (copy-able)
      * Number of appointment types by month
        + Columns of months
        + Rows of “type: #”
      * The schedule for each consultant
      * One additional report of your choice
        + Number of appointments by consultant by month
* Back end
  + Login form
    - Log timestamp and whether login attempt was successful
      * If file exists, append to .txt file using collection classes
    - Verify username/password combination
      * Exception if not
  + Alerts (run upon login)
    - Fetch current time
    - Search database for appointments starting within 15 minutes
    - Display alert if found.
      * Otherwise, do nothing.
  + Calendar
    - On load, access database
    - On change of month/week or time zone switchers, reload calendar data
    - On click of navigating to adjacent month/week, load corresponding data
  + Database
    - On load, fetch data from database
    - Save changes upon clicking “save”
    - Exception for the following:
      * Scheduling an appointment outside business hours
      * Scheduling overlapping appointments
      * Customer data is invalid or nonexistent
  + Reports
    - Each button opens a new form with database fetched data properly formatted
    - Use collection classes
  + General
    - Lambdas
      * Two or more
      * Comment justification for use

The application displays the login labels in English, however, the use of localization to display the login and error controls in a second language is not evident.

Change to use region

The application allows the user to add customer records, however, there is an exception when a customer record is edited. For example, changing the customer name results in a fatal error that crashes the application.

The application includes a GUI interface that allows the user to add appointments, however, there is an error when the appointment is saved.

The application includes radio buttons to select view by week or month. The view by month display a calendar for the entire year 2025. The year that contains the set appointments from the database are clearly evident in the view.

Use either a single month view, or just list all appointments for this month

Bold current month’s appointments

MonthChange event bolds selected month’s appointments

The application includes functionality to allow the user to add times to the appointments, however, timezone functionality is not evident.

Front-end time should all be local time

Reports

Database

Calendar

Exception handling has been appropriately implemented for handling login errors and out-of-office hours appointments. Overlapping appointments are allowed to be created, and invalid customer data is allowed to be saved.

“Overlapping appointments are allowed to be created” –Bug not replicable. Whether creating or modifying an appointment, program always alerts user and does not save changes.

“invalid customer data is allowed to be saved.” –Bug not replicable. When a nonexistent address, city, or country is entered for a customer record, the program creates a new address, city, or country record; however, if a nonexistent customer is entered for an appointment record, the program does not create or modify the record.

Code exists in the application for displaying appointment alerts. The appointment notification does not appropriately display for appointments that are within 15 minutes of the user's login event.

“The appointment notification does not appropriately display for appointments that are within 15 minutes of the user's login event.” –Bug not replicable; however, a related bug that repeated alerts was fixed