C868 – Software Capstone Project Summary

Task 2 – Section C

Capstone Proposal Project Name: Appointment Ace - Scheduler Application

Student Name: Adam Wright

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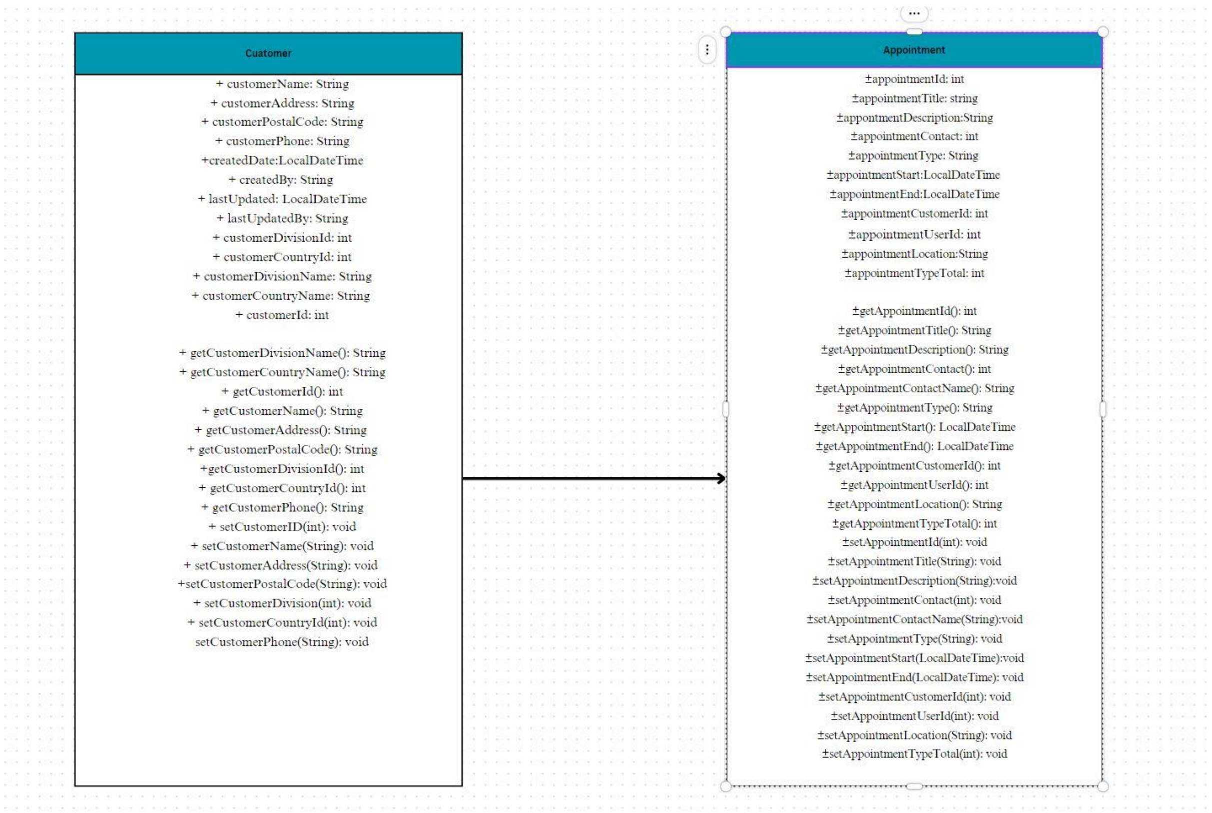
Task 2 Part C – C868 Software Development Capstone

Application Design and Testing

Design Document

Class Design

The illustrations below represent the class design for Application Ace, the Java scheduler Application. The classes shown directly map to the database tables that form the interior of the application data. The main classes for this application are the Appointments class and Customer class because of the one-to-one relationship these classes share


Cuatomer
+ customerName: String
+ customerAddress: String
+ customerPostalCode: String
+ customerPhone: String
+createdDate:LocalDateTime
+ createdBy: String
+ lastUpdated: LocalDateTime
+ lastUpdatedBy: String
+ customerDivisionId: int
+ customerCountryId: int
+ customerDivisionName: String
+ customerCountryName: String
+ customerId: int
+ getCustomerDivisionName(): String
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+ setCustomerID(int): void
+ setCustomerName(String): void
+ setCustomerAddress(String): void
+setCustomerPostalCode(String): void
+ setCustomerDivision(int): void
+ setCustomerCountryId(int): void
setCustomerPhone(String): void
Appointment
±appointmentId: int
±appointmentTitle: string
±appontmentDescription:String
±appointmentContact: int
±appointmentType: String
±appointmentStart:LocalDateTime
±appointmentEnd:LocalDateTime
±appointmentCustomerId: int
±appointmentUserId: int
±appointmentLocation:String
±appointmentTypeTotal: int
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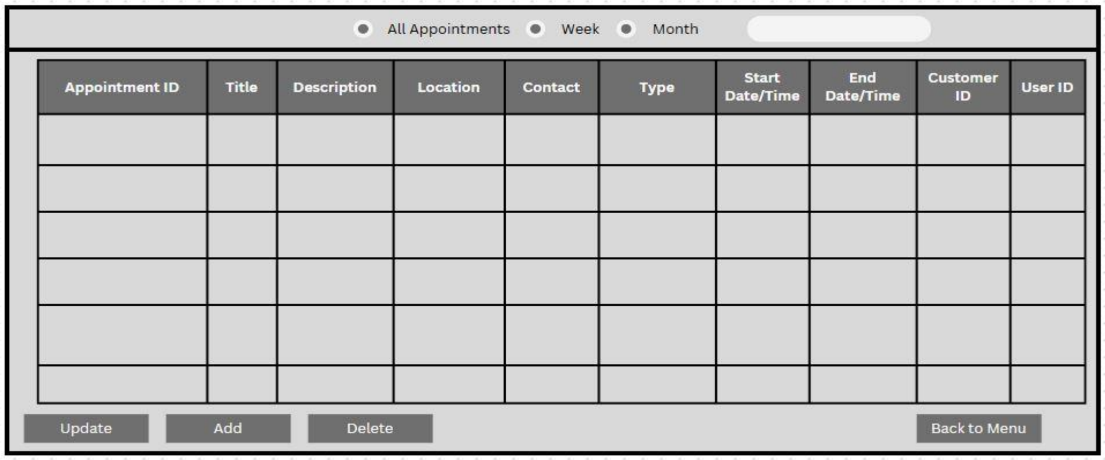
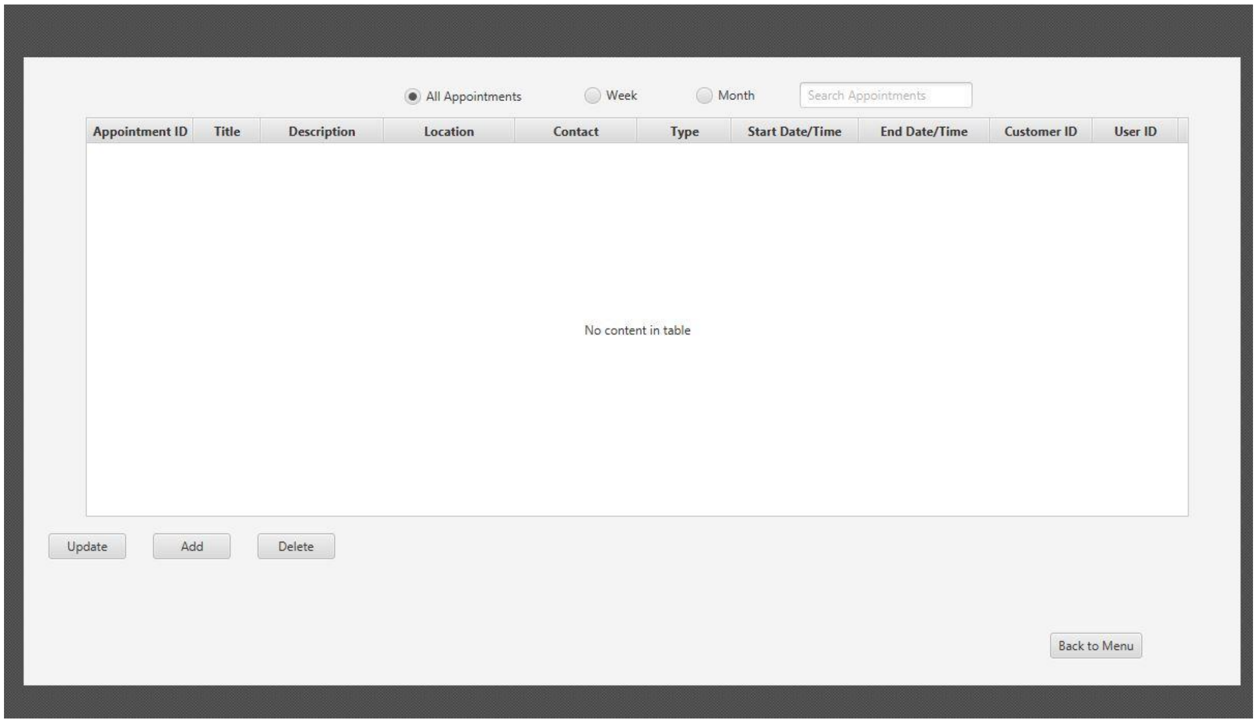
±getAppointmentTitle(): String
±getAppointmentDescription(): String
±getAppointmentContact(): int
±getAppointmentContactName(): String
±getAppointmentType(): String
±getAppointmentStart(): LocalDateTime
±getAppointmentEnd(): LocalDateTime
±getAppointmentCustomerId(): int
±getAppointmentUserId(): int
±getAppointmentLocation(): String
±getAppointmentTypeTotal(): int
±setAppointmentId(int): void
±setAppointmentTitle(String): void
±setAppointmentDescription(String):void
±setAppointmentContact(int): void
±setAppointmentContactName(String):void
±setAppointmentType(String): void
±setAppointmentStart(LocalDateTime):void
±setAppointmentEnd(LocalDateTime): void
±setAppointmentCustomerId(int): void
±setAppointmentUserId(int): void
±setAppointmentLocation(String): void
±setAppointmentTypeTotal(int): void

UI Design

This document showcases the Appointments Screen's wireframes, including both low-fidelity and high-fidelity versions. A filter section at the top of the screen utilizes radio buttons to allow users to switch between viewing all appointments, appointments for the current week, or appointments for the current month. Users can manage their appointments through intuitive controls: adding new appointments, deleting existing ones, and updating appointment details. In the top right corner, a search bar empowers users to find specific information related to appointments or customers. For managing appointments, dedicated buttons for update, add, and delete are conveniently located at the bottom left of the application. Finally, a clear exit strategy is provided with a "Back to Menu" button positioned in the bottom right corner, allowing users to return to the main menu screen.



Low Fidelity Wireframe of the Appointments Screen



High-Fidelity Wireframe of the Appointments Screen

Unit Test Plan

Introduction

Purpose

Unit testing is vital in guaranteeing the Login class functions as expected. The login class plays a crucial role in application security by handling user login attempts. This unit test focuses on verifying the core functionality of the authenticate method within the Login class. The first test, `testLoginWithCorrectPassword`, simulates a user login scenario with valid credentials. It asserts that the authenticate method returns true when presented with the correct username and password combination. This confirms that the login process functions correctly for authorized users.

The second test, `testLoginWithIncorrectPassword`, simulates a login attempt with an invalid password. It asserts that the authenticate method returns false for incorrect credentials. This ensures the system rejects unauthorized login attempts, upholding security measures. By successfully running these unit tests, we gain confidence that the authenticate method behaves as intended, differentiating between valid and invalid login attempts.

Overview

Ensuring secure login functionality is paramount for the customer scheduler application. It protects the sensitive customer and application data contained within the application from unauthorized users. The test simulates a user login scenario with valid credentials and verifies authorized users. The second test simulates a login user attempt with invalid credentials. This safeguards the application from unauthorized access and protects sensitive customer data. By running these unit tests, we gain confidence that the login process functions as intended, differentiating between authorized and unauthorized users. This strengthens the overall security of the customer scheduler application. The unit test is written using the Junit framework and executed within the IntelliJ IDE. By right-clicking the Unit Test directory and selecting “Run Test in UnitTest” the test will execute. The test will cover testing the login credentials.

Test Plan

Items

Simulating various login attempts is crucial for the effectiveness of the login functionality. The provided unit test achieves this by creating login objects and manipulating credentials.

The first test, **`testLoginWithCorrectPassword`**, simulates a user login scenario with valid credentials. It verifies that the **`authenticate`** method in **`Login`** successfully recognizes authorized users by asserting that it returns **`true`** with the correct username and password combination.

The second test, **`testLoginWithIncorrectPassword`**, simulates a login attempt with invalid credentials. It ensures the system rejects unauthorized access by asserting that the **`authenticate`** method returns **`false`** for incorrect credentials

These Login tests provide a basic foundation for verifying the login functionality. Additional tests could be created to simulate more complex scenarios, such as empty usernames or passwords. In essence, these unit tests act as controlled experiments, ensuring the login process differentiates between authorized and unauthorized users.

Features

Within the Login class, user authentication logic ensures only authorized users can access appointment functionalities**.** This authentication is typically achieved through a method like `authenticate` that verifies username and password combinations. The authenticate object is contained within the `Controller.Login` class.

Deliverables

When executed, this code produces informative console output for each unit test. The test names clearly describe their purpose, such as "testLoginWithCorrectPassword" and "`testLoginWithIncorrectPassword`." The output for each test will display:

- **Test Name:** The name of the test case being executed, like "`testLoginWithCorrectPassword`".
- **Test Result:** "true" or "false" depending on the assertion's outcome. A successful test with a correct password should display "true".
- **Pass/Fail Message:** A human-readable message indicating the test's success or failure. For example, "Test passed: Able to login with correct password".

Tasks

Steps for executing the unit test:

1. Within the Intellij IDE, initiate the test environment by right-clicking the project folder and selecting “New” followed by “Directory”. This establishes a dedicated directory for housing the unit test code.
2. Navigate to the newly created directory and right-click. Select “New” and then “Package” to define a logical structure for organizing your test classes within the project.

3. Within the newly created package, right-click and choose “New” followed by “Java Class”. This step establishes the Java class that will encapsulate your unit test logic.
4. Populate the newly created Java class with the necessary code to conduct the unit test. This involves leveraging the Junit framework to set up the validation scenario you intend to test.
5. Right-click on the directory containing your test classes and select “Run all tests” to initiate the test suite execution.
6. Following test execution, meticulously examine the generated output within the console window. This output provides crucial insights regarding the test success or failure and can guide further debugging efforts if necessary.

Dependency Needs

The described configuration has a few dependencies. The Java-packaged libraries used here are:

- `mysql-connector-java-8.0.25` (database connector for java)
- `Junit 4.13.1` (JUnit test framework)

Pass/Fail Criteria

A test is considered successful if it meets the following criteria:

- The test method **`testLoginWithCorrectPassword`** or **`testLoginWithIncorrectPassword`** runs completely without encountering any errors or exceptions.

- The assertion statement within the test `assertTrue` or `assertFalse` evaluates to true. This signifies that the authenticate method's behavior aligns with the test expectations for a valid or invalid login attempt.

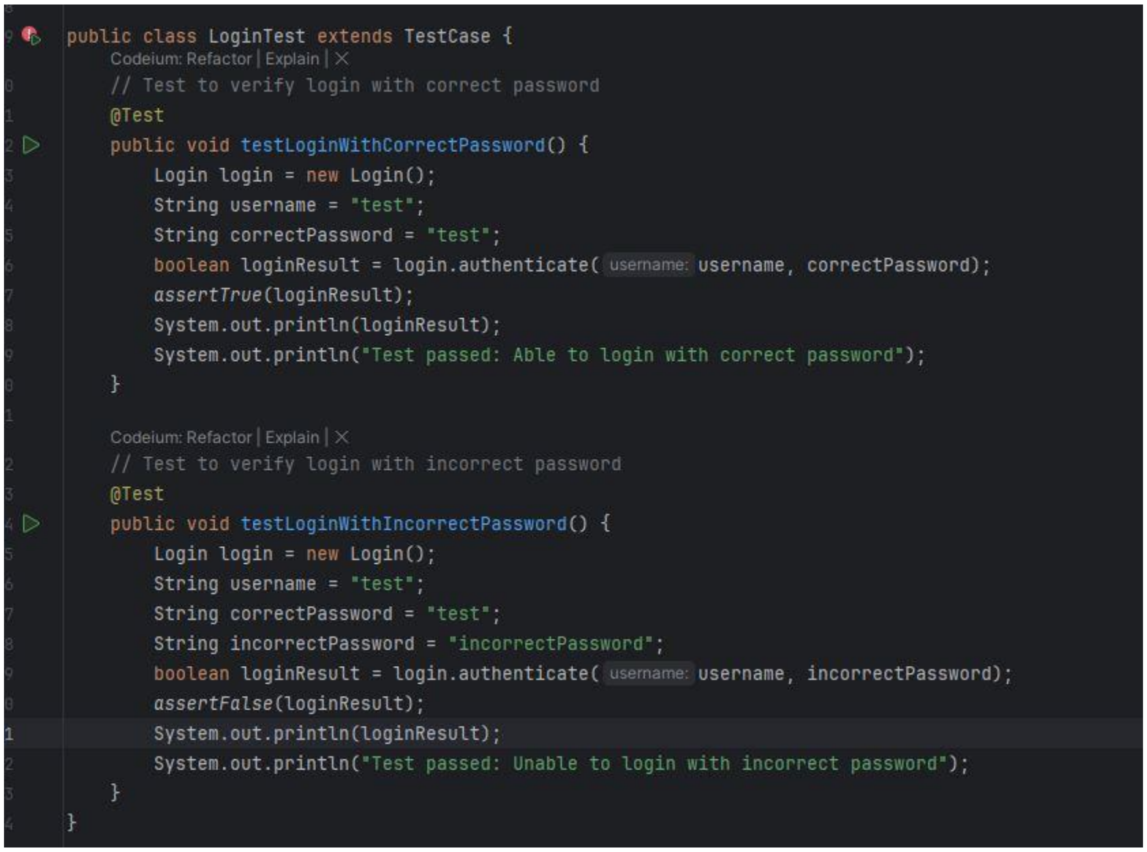
A failing test can occur due to two main reasons:

- The test throws an exception typically an `AssertionError`. This happens when the assertion evaluates to false, indicating a discrepancy between the expected and actual behavior of the authenticate method.
- The test might not complete its execution due to problems within the authenticate method itself or errors in the setup.

Specifications

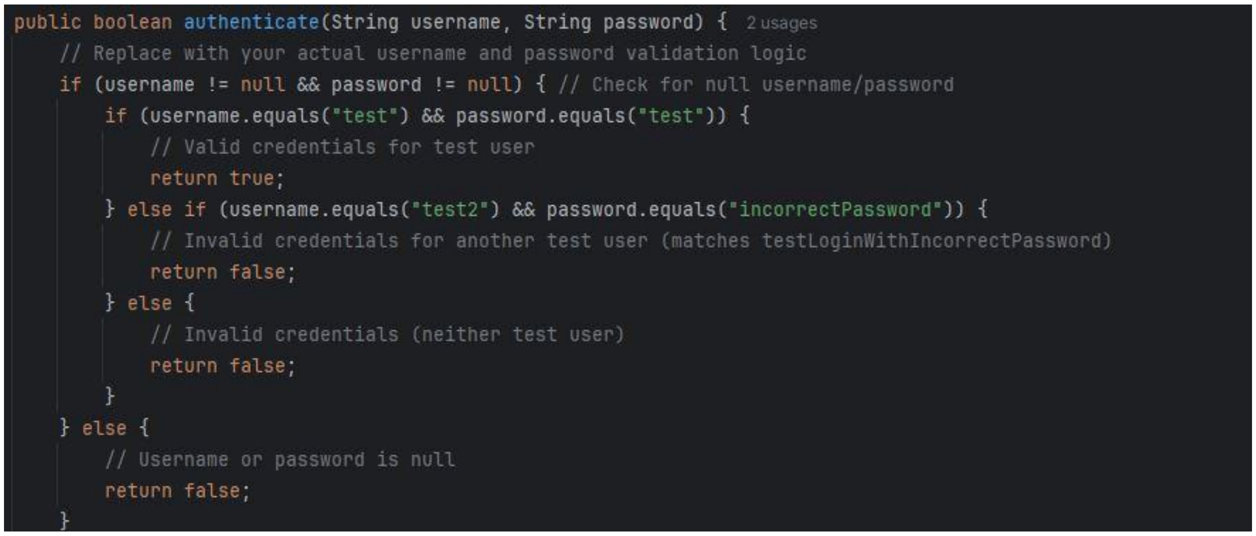
This code snippet showcases a unit test for the login functionality. Written within the `LoginTest` class, it leverages the JUnit framework to verify login behavior. The test resides in the `UnitTest` package, specifically the `LoginTest.java` file. The directory is

UnitTest/LoginTest.java



```
public class LoginTest extends TestCase {
    Codeium: Refactor | Explain | ×
    // Test to verify login with correct password
    @Test
    public void testLoginWithCorrectPassword() {
        Login login = new Login();
        String username = "test";
        String correctPassword = "test";
        boolean loginResult = login.authenticate( username: username, correctPassword);
        assertTrue(loginResult);
        System.out.println(loginResult);
        System.out.println("Test passed: Able to login with correct password");
    }

    Codeium: Refactor | Explain | ×
    // Test to verify login with incorrect password
    @Test
    public void testLoginWithIncorrectPassword() {
        Login login = new Login();
        String username = "test";
        String correctPassword = "test";
        String incorrectPassword = "incorrectPassword";
        boolean loginResult = login.authenticate( username: username, incorrectPassword);
        assertFalse(loginResult);
        System.out.println(loginResult);
        System.out.println("Test passed: Unable to login with incorrect password");
    }
}
```



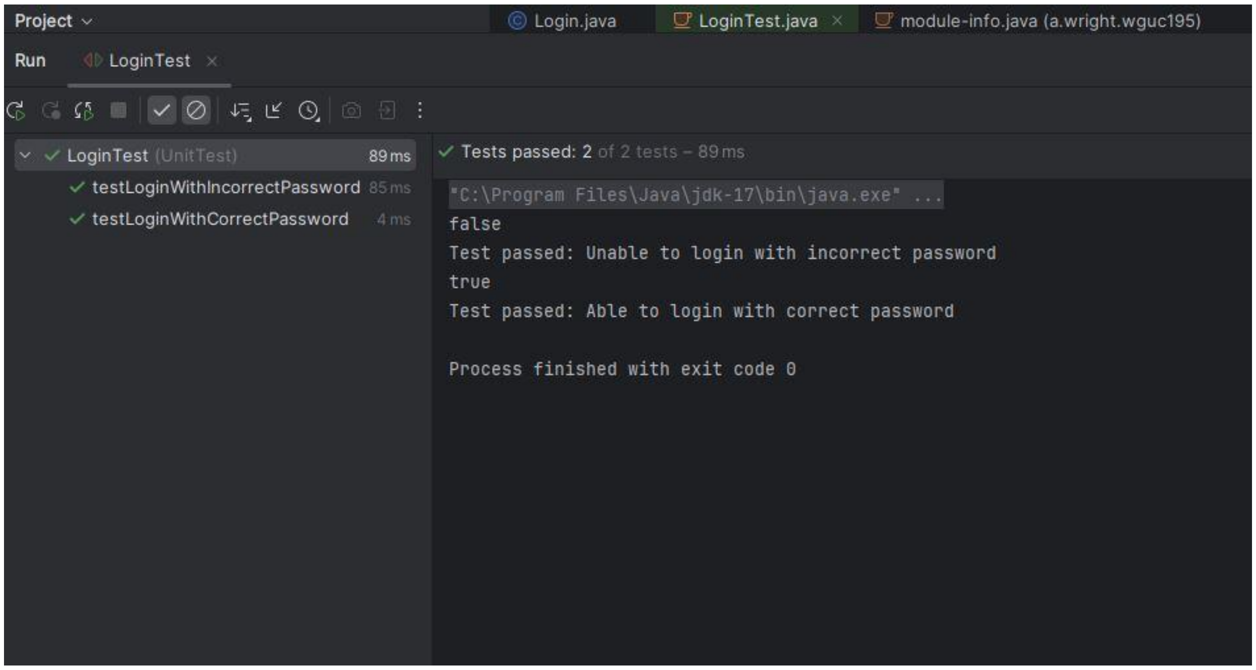
```
public boolean authenticate(String username, String password) {  2 usages
    // Replace with your actual username and password validation logic
    if (username != null && password != null) { // Check for null username/password
        if (username.equals("test") && password.equals("test")) {
            // Valid credentials for test user
            return true;
        } else if (username.equals("test2") && password.equals("incorrectPassword")) {
            // Invalid credentials for another test user (matches testLoginWithIncorrectPassword)
            return false;
        } else {
            // Invalid credentials (neither test user)
            return false;
        }
    } else {
        // Username or password is null
        return false;
    }
```

Procedures

The first thing I needed to do was to ensure Junit was properly configured in the development environment, and then I created to `LoginTest.Java` test file. Before writing the test, I examined the login class to identify its functionalities. I created the `authenticate` method which assisted with the username and password arguments and it returns a Boolean which indicates successful authentication. The `LoginTest.Java` unit test includes two test methods and the first is `testLoginWithCorrectPassword()` which simulates a login attempt with valid credentials and verifies the `authenticate()` method returns `true` and the string message ("Test Passed: Able to login with the correct password"). The second method is `testLoginWithIncorrectPassword()` which simulates a login attempt with invalid credentials and verifies the `authenticate()` method returns `false` and the string message ("Test Passed: Unable to login with an incorrect password.").

Results

If the assertions within the test methods `assertTrue` and `assertFalse` evaluate correctly, the test will pass. The console output will include the test names with a green check next to them indicating a successful test run. If an assertion fails or an exception occurs during the test executions, the test will fail. The console out will show the failing test name, the failing assertion, and an error message.


Project
Login.java
LoginTest.java
module-info.java (a.wright.wguc195)
Run
LoginTest
LoginTest (UnitTest) 89 ms
testLoginWithIncorrectPassword 85 ms
testLoginWithCorrectPassword 4 ms

Tests passed: 2 of 2 tests – 89 ms

```
"C:\Program Files\Java\jdk-17\bin\java.exe" ...
false
Test passed: Unable to login with incorrect password
true
Test passed: Able to login with correct password

Process finished with exit code 0
```

C4. Source Code

A compressed version of the source code can be found in the file named WGU195.zip

C5. Link to Live Version

https://github.com/Adamw0615/WGUC868-Capstone

User Guide

Set up and Run Application for Maintenance Purposes

This guide will walk you through configuring your Windows machine to run the Java application for making code changes or fixing bugs. If you're using a different operating system, there might be slight variations in the setup process. Don't worry, though - we've included instructions for non-Windows systems here:

https://www.jetbrains.com/help/idea/installation-guide.html#requirements.

Prerequisites

The following installations are required:

- Java SE version17.0.10
- JavaFX version: 17.0.10
- MYSQL Connector for Java 8.0.25
- The MySQL database management system.

Installation

Click the link above to download the project file:

1. The jar file needs to be saved to your desktop (It will be easier to locate the application.

2. The database has already been created. (This has been done for the convenience of the users.)

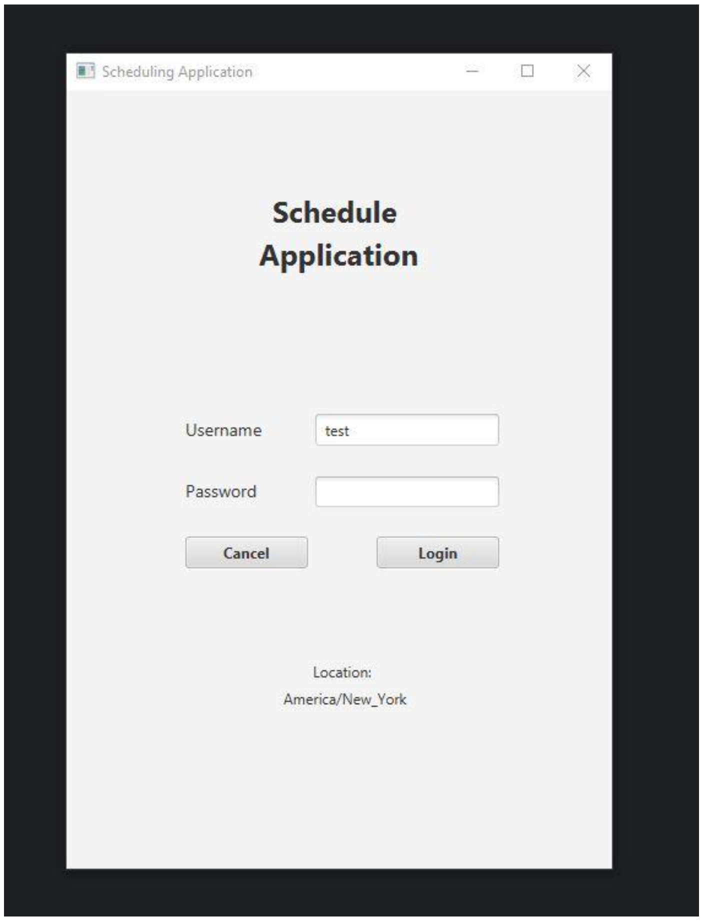
Guide for Admin User

This guide is your roadmap to mastering Application Ace! We'll walk you through all the features and functionalities in detail, so you can leverage the application to its full potential for tracking your customer appointments.

Login using an Admin Account

Application Ace takes the security of your customer data seriously. Since the information you track is considered sensitive, creating new contacts is disabled by default. To ensure authorized access, only approved users will receive admin credentials distributed securely by a senior developer. These credentials grant access to create new contacts and unlock all features within the application.

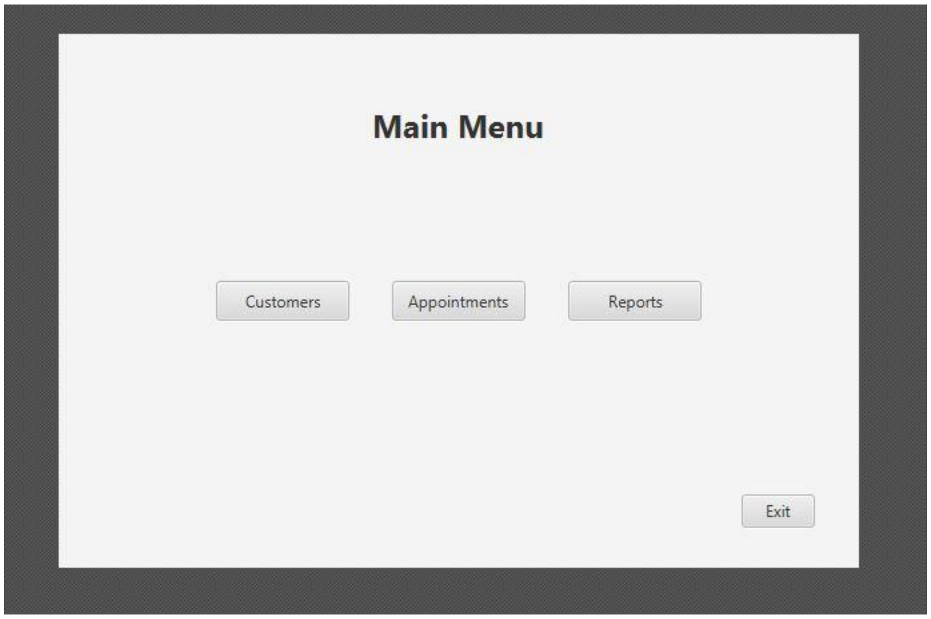
For admins logging in, simply enter "test" for both the username and password, then click the login button. Upon successful login, you'll be redirected to the Main screen with full functionality available.



View and Managing Customers, Appointments or Reports

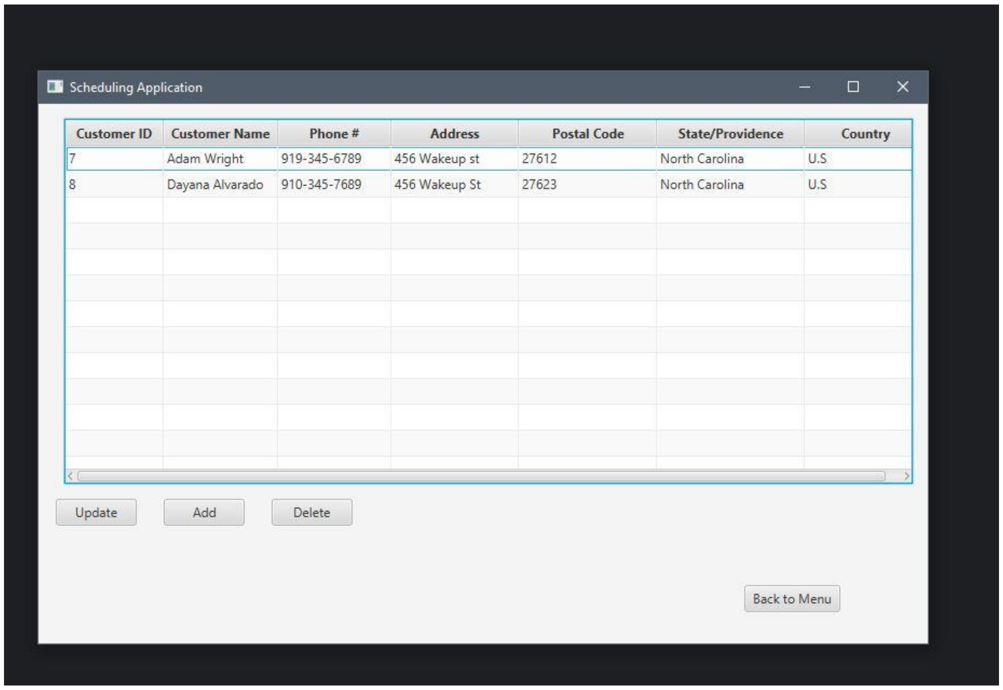
Menu

Once you've successfully logged in as an admin, you'll be greeted by a menu screen. Three buttons - "Customers", "Appointments", and "Reports" - will be prominently displayed in the center, allowing you to navigate to these specific sections of the application. Additionally, an exit button located in the bottom-right corner provides a convenient way to close the application.



Viewing Customers

Clicking the "Customers" button on the main menu after logging in as an admin takes you to the dedicated Customer interface. This section allows you to view and manage your customer data. For your convenience, the customer data can be sorted by clicking on the column headers, letting you easily organize your records based on specific needs.



Customer ID	Customer Name	Phone #	Address	Postal Code	State/Providence	Country
7	Adam Wright	919-345-6789	456 Wakeup st	27612	North Carolina	U.S
8	Dayana Alvarado	910-345-7689	456 Wakeup St	27623	North Carolina	U.S

Creating A New Customer

The "Customers" interface empowers admins to create new customer profiles. Simply click the "Add" button located at the bottom-left corner, beneath the customer table. A user-friendly form will appear, clearly labeled with text fields for each required piece of information. Country and division can be conveniently selected from pre-defined dropdown lists. For added accuracy, the address field even validates entries to ensure they match the chosen country's format.

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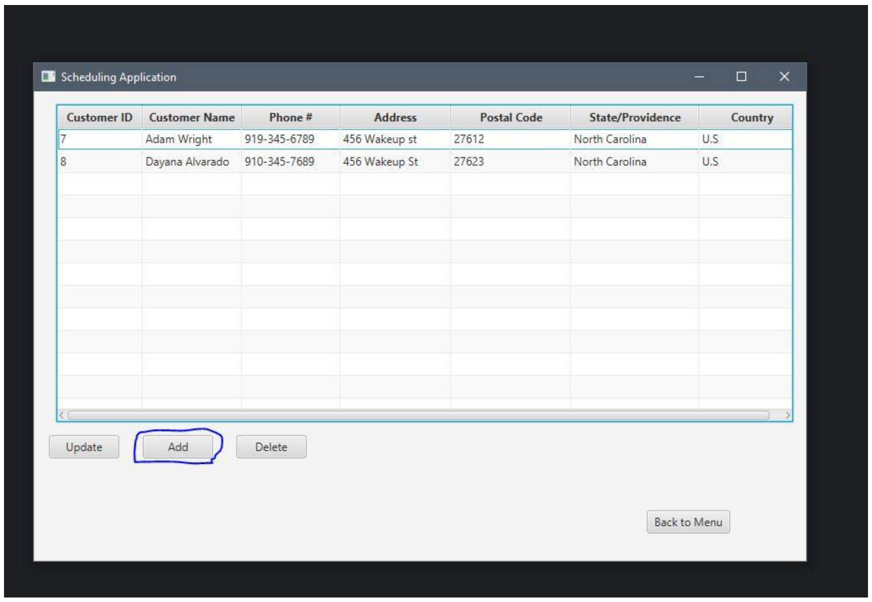
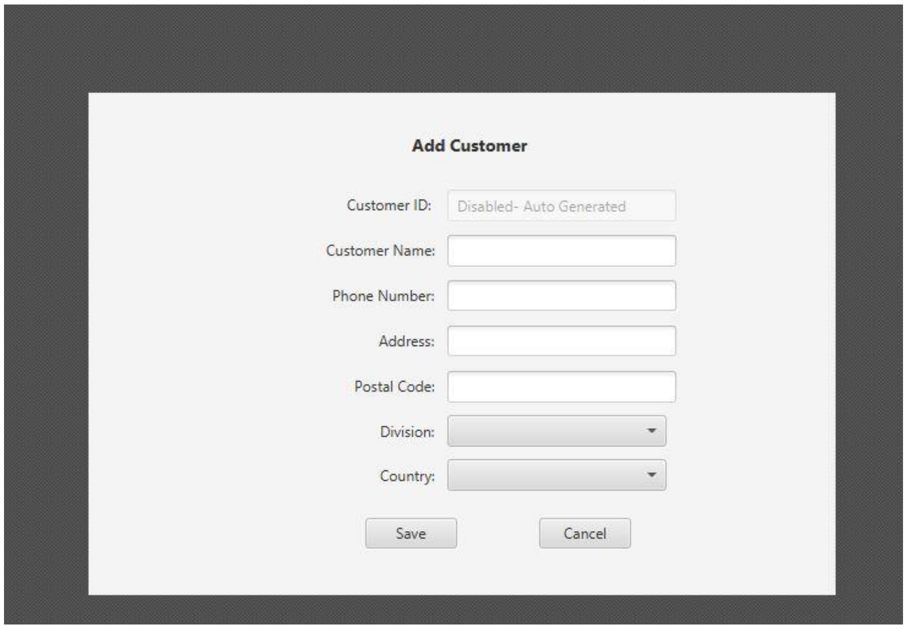
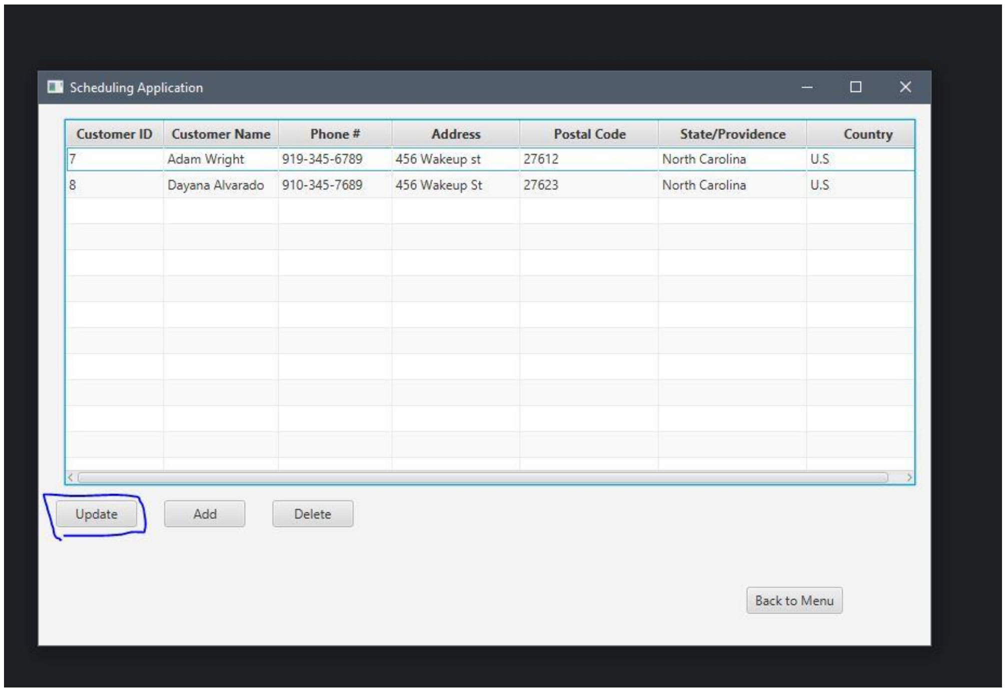


Customer ID	Customer Name	Phone #	Address	Postal Code	State/Providence	Country
7	Adam Wright	919-345-6789	456 Wakeup st	27612	North Carolina	U.S
8	Dayana Alvarado	910-345-7689	456 Wakeup St	27623	North Carolina	U.S



Updating A Customer

The "Customers" interface also allows admins to modify existing customer profiles. To update a customer's details, navigate to the "Customers" menu, then click on the specific customer you want to modify. Once selected, an "Update" button will appear in the bottom-left corner, beneath the customer table. Clicking this button will launch a form where you can make the necessary changes.



Customer ID	Customer Name	Phone #	Address	Postal Code	State/Providence	Country
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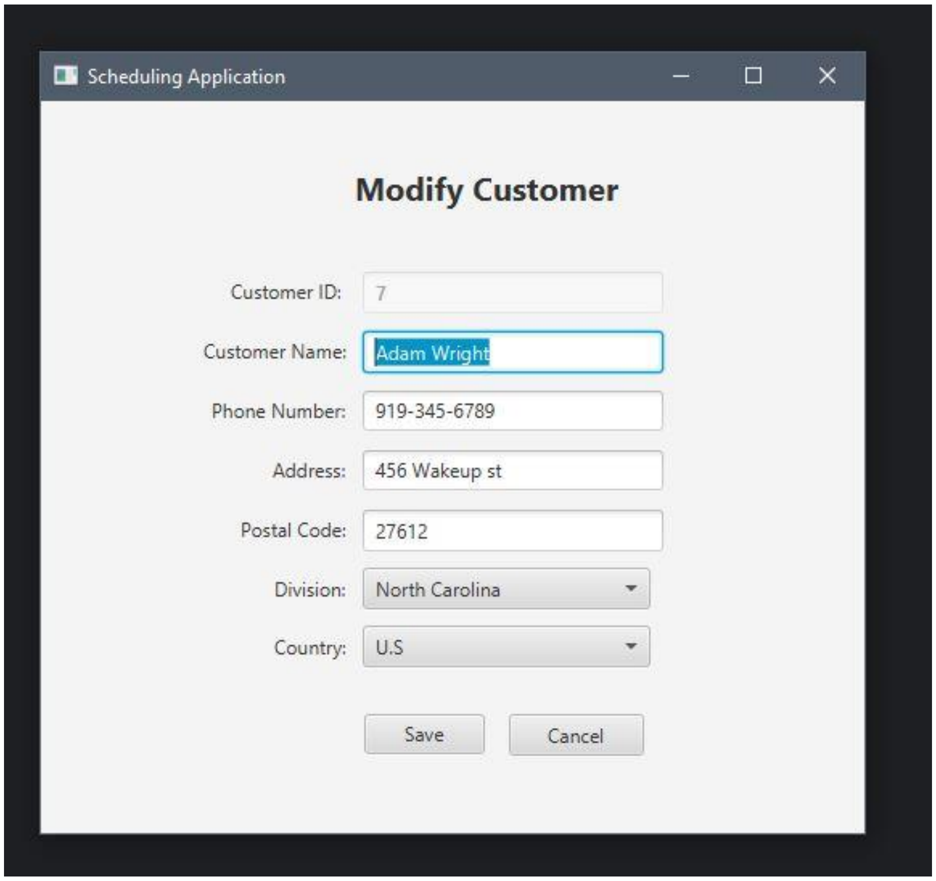
8	Dayana Alvarado	910-345-7689	456 Wakeup St	27623	North Carolina	U.S

Updating a customer profile in Application Ace is similar to adding a new one. Navigate to the "Customers" menu and select the customer you want to modify. Click the "Update" button that appears, and you'll see a familiar form for entering customer information.

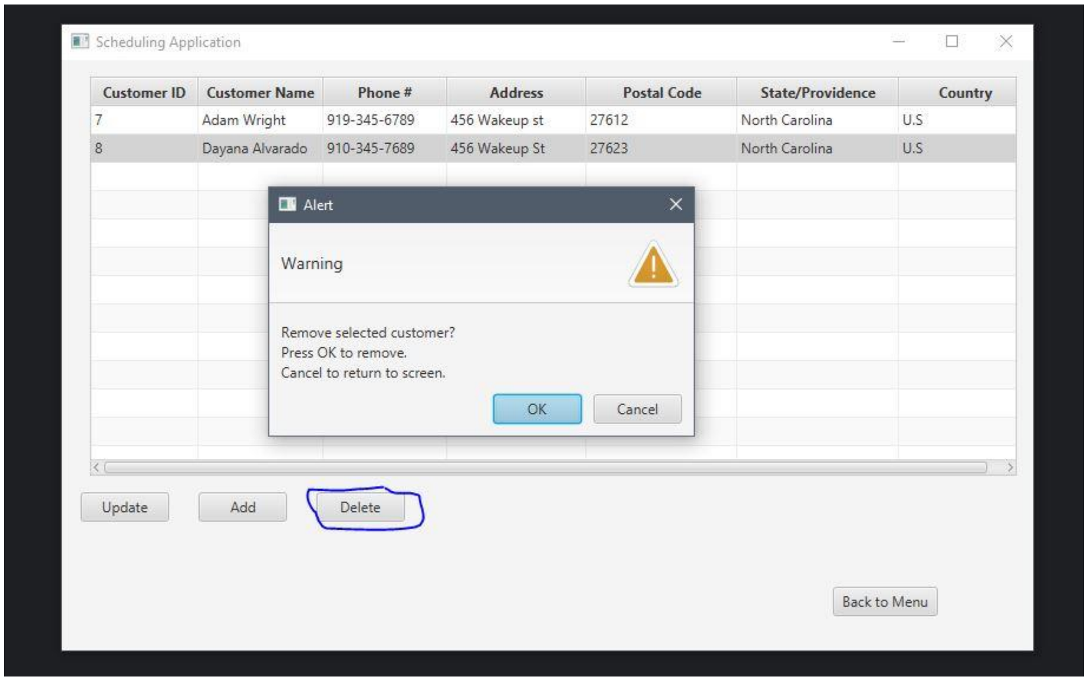


Modify Customer

Customer ID:	7
Customer Name:	Adam Wright
Phone Number:	919-345-6789
Address:	456 Wakeup st
Postal Code:	27612
Division:	North Carolina
Country:	U.S

Removing A Customer

Application Ace allows admins to delete customer profiles, but only if the customer has no upcoming appointments. To delete a customer, navigate to the "Customers" menu and select the desired customer from the table. Click the "Delete" button, and the application will verify the selection. If the customer has no associated appointments, the deletion will proceed successfully, and a confirmation message will appear on the screen. However, attempting to delete a customer with scheduled appointments will trigger an error message, reminding you to choose a customer without upcoming events before proceeding.



Customer ID	Customer Name	Phone #	Address	Postal Code	State/Providence	Country
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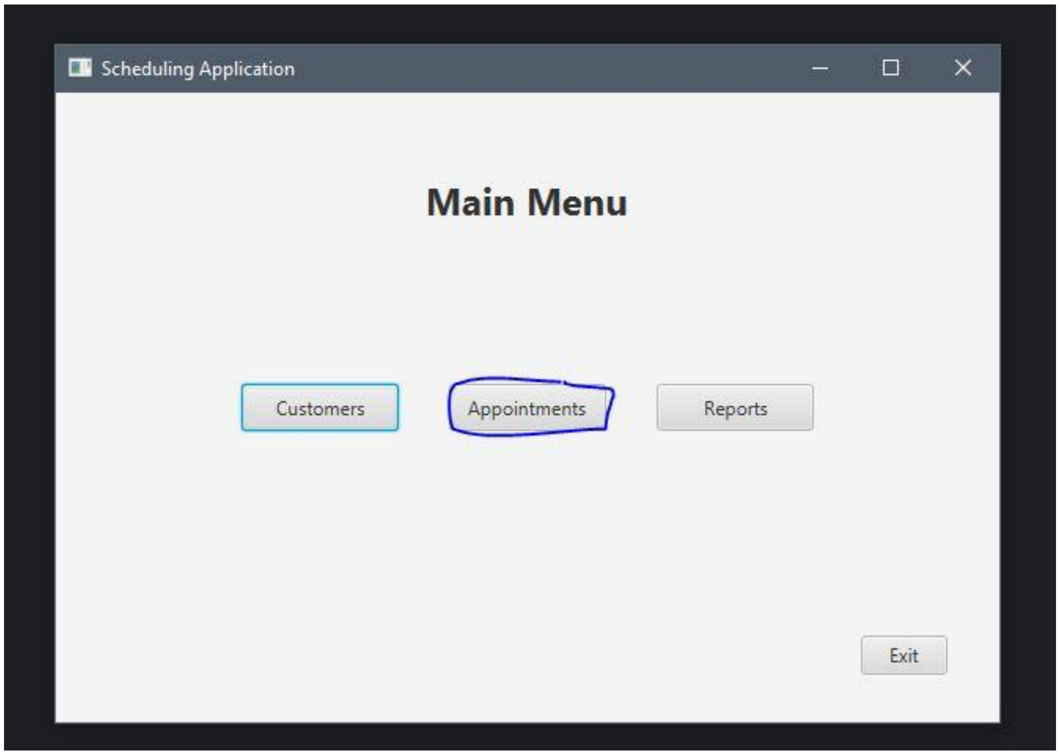
Remove selected customer?
Press OK to remove.
Cancel to return to screen.

View and Manage Appointments

Viewing Appointments by the month and week

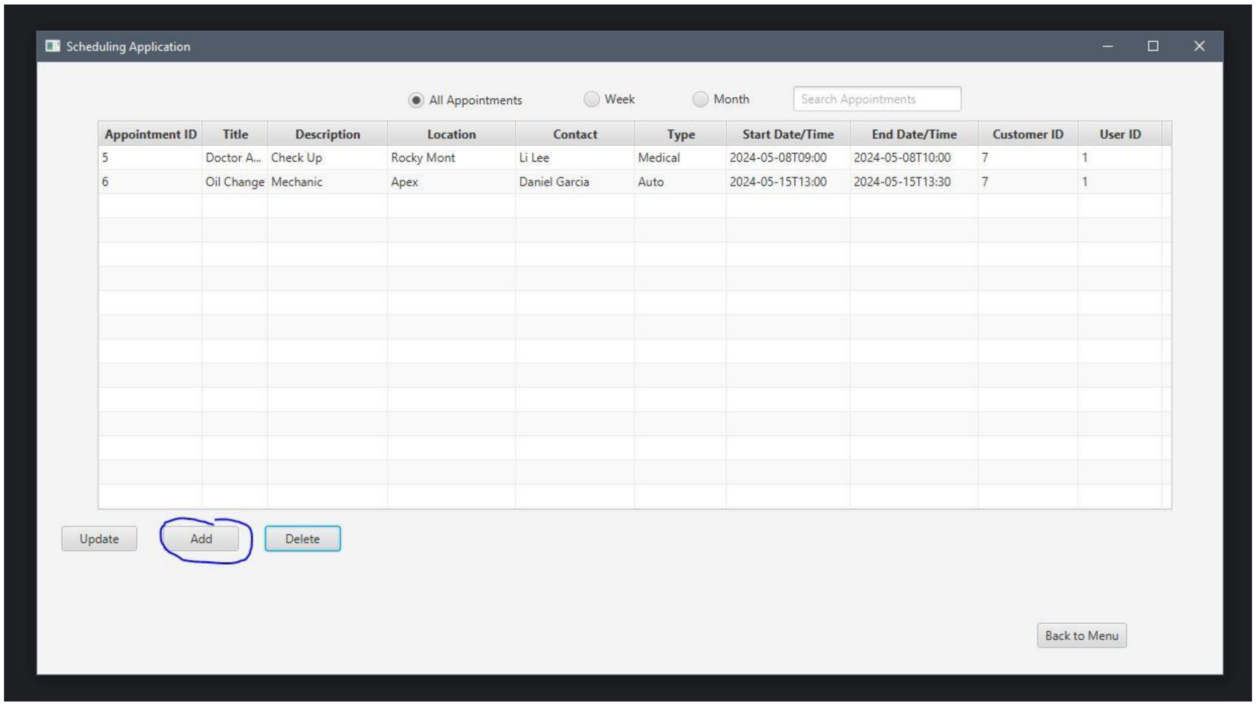
Once logged in as an admin, head to the "Appointments" section by clicking the corresponding button on the main menu. This will display the Appointments table, showcasing all scheduled appointments with their unique IDs. A powerful search filter sits above the table on the right, allowing you to search by various criteria like Appointment ID, title, description, location, and more. Simply enter your search term and watch the table update to reflect your chosen filter. Removing the text from the search bar conveniently resets the table to display all appointments.

For organizing your view, three radio buttons located at the top center of the table provide options for no filter, displaying appointments by week, or by month. Additionally, a set of buttons at the bottom left corner empowers you to manage appointments. Use the "Update" button to modify existing appointments, "Add" to create new ones, and "Delete" to remove appointments as needed. Finally, a "Back to Menu" button on the bottom right lets you return to the main menu for further navigation.



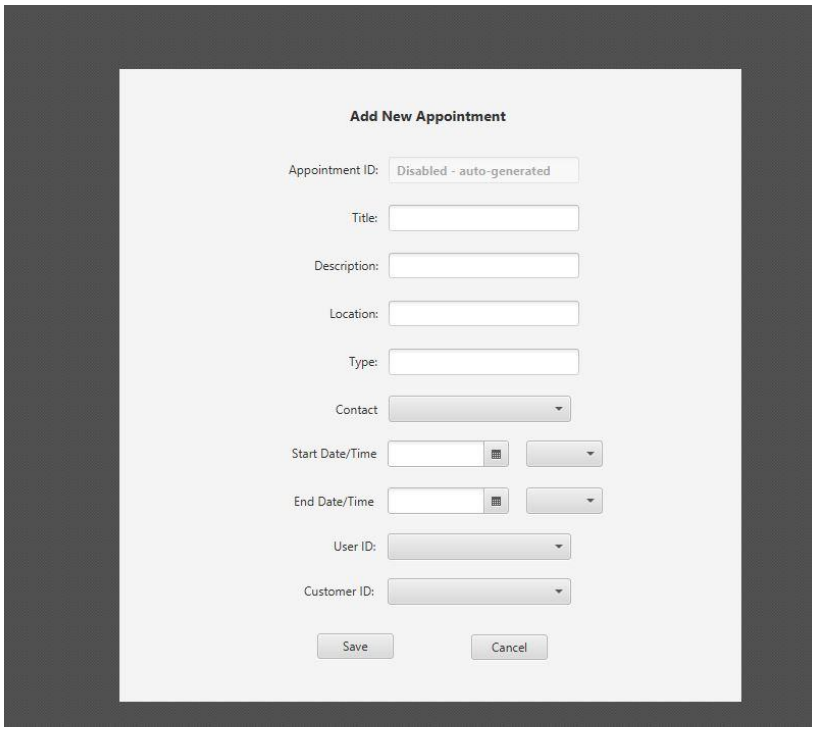
Creating New Appointments

Admins can create new appointments within the "Appointments" section. Navigate there by clicking the "Appointments" button on the main menu after logging in. Look for the "Add" button positioned at the bottom left corner of the Appointments table. Clicking this button will launch the dedicated "Add Appointment" screen, where you can enter the necessary details for scheduling a new event.



Appointment ID	Title	Description	Location	Contact	Type	Start Date/Time	End Date/Time	Customer ID	User ID
5	Doctor A...	Check Up	Rocky Mont	Li Lee	Medical	2024-05-08T09:00	2024-05-08T10:00	7	1
6	Oil Change	Mechanic	Apex	Daniel Garcia	Auto	2024-05-15T13:00	2024-05-15T13:30	7	1

Selecting the “Add” button will bring up the add appointment form to add a new appointment.



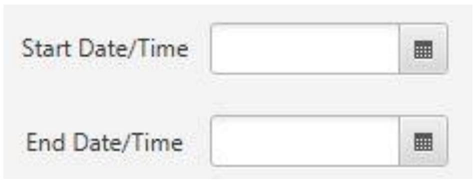
Add New Appointment

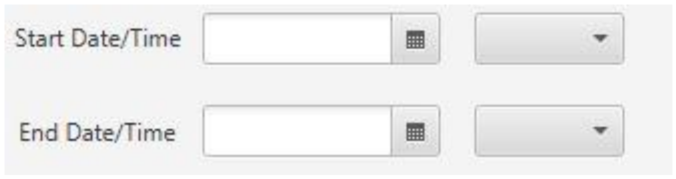
Appointment ID:	Disabled - auto-generated
Title:	
Description:	
Location:	
Type:	
Contact	
Start Date/Time	
End Date/Time	
User ID:	
Customer ID:	

To set the contact on the add appointment form, select the contact drop-down box, and select the preferred contact from the drop-down list.

The "Add Appointment" screen allows you to define the date and time for the event. Look for the "Start Date" field and click on it. A calendar will pop up, letting you conveniently choose the desired date for the appointment. Navigate through the months and years using the arrow buttons located on either side of the calendar display. Once you've selected the perfect date, simply click on it to confirm your choice.

After selecting the date using the calendar, you can define the specific time for the appointment. Locate the drop-down list positioned to the right of the date selector and click on it to reveal available time slots. It's important to note that appointments can only be scheduled within business hours. If you attempt to select a time outside these designated hours, an error message will pop up to alert you and prevent the invalid selection.

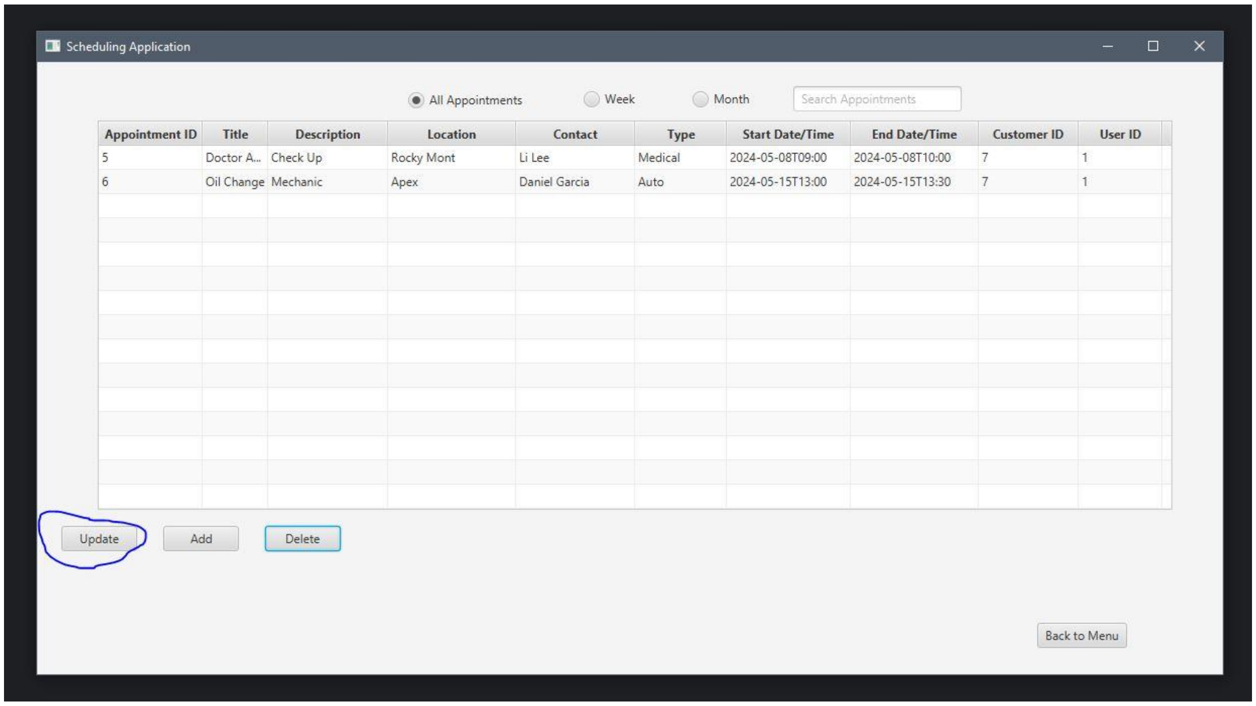




With the date and time set, it's time to link the appointment to the specific user and customer. Enter the relevant user ID and customer ID in the designated fields on the "Add Appointment" screen. Once everything is filled out, click the "Save" button. This will finalize the appointment creation, save it to the system, and return you to the main Appointments table where you'll see the newly scheduled event listed.

Updating An Appointment

The Appointments table allows you to edit existing appointments. Simply locate the appointment you want to modify and select it from the table. Once chosen, an "Update" button will appear in the bottom left corner. Clicking this button will launch the "Modify Appointment" form, where you can make the necessary changes to the appointment details and save them to the system.



Appointment ID	Title	Description	Location	Contact	Type	Start Date/Time	End Date/Time	Customer ID	User ID
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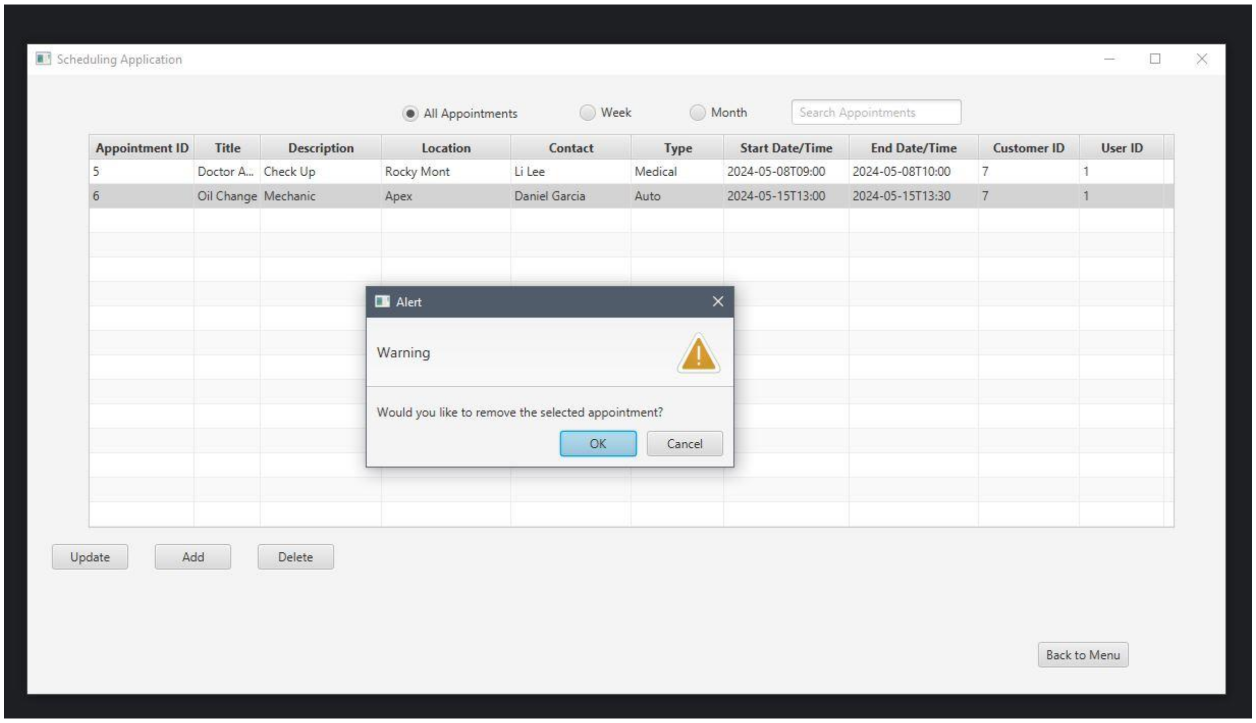
6	Oil Change	Mechanic	Apex	Daniel Garcia	Auto	2024-05-15T13:00	2024-05-15T13:30	7	1

The modify appointment form functions the same as the add appointment form. There are drop-down lists, one for the contacts, date/time. The dates can be changed via the date calendar and the time drop-down list.

Deleting An Appointment

The user will be able to delete appointments. First, select the appointment that is to be deleted, then select the “Delete” button located under the appointment table. This action will remove the appointment and a confirmation message will appear.



Appointment ID	Title	Description	Location	Contact	Type	Start Date/Time	End Date/Time	Customer ID	User ID
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6	Oil Change	Mechanic	Apex	Daniel Garcia	Auto	2024-05-15T13:00	2024-05-15T13:30	7	1

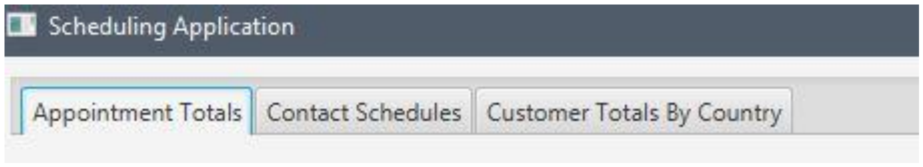
Warning

Would you like to remove the selected appointment?

Viewing Appointment Reports

There will be three reports that will be accessible to the users of the application:

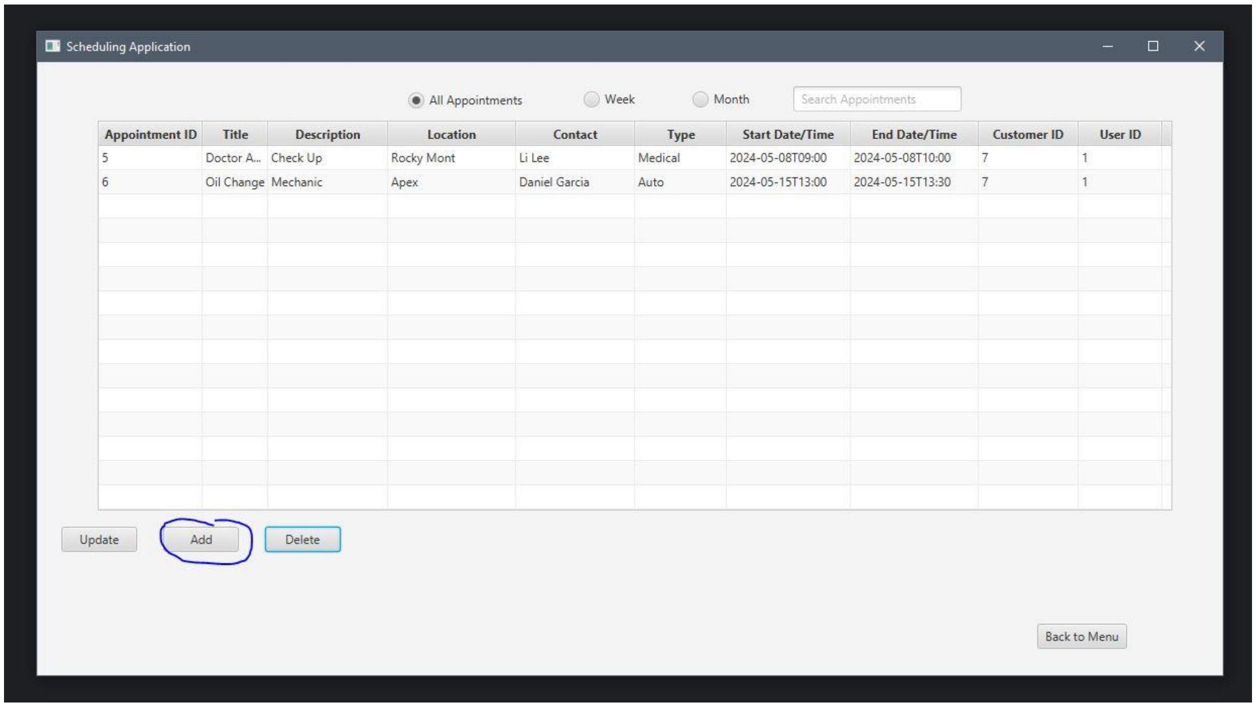
1. The first tab will display the total number of appointments by the appointment type and appointment month.
2. The second tab report will display the contact schedules.
3. The third tab report will display the total amount of customers filtered by country.



Appointment by Type and Month

Application Ace offers built-in reporting functionality, allowing you to view and print valuable appointment data. Navigate to the "Reports" section from the main menu. Within the reports interface, you'll find a "Print" option conveniently located at the top of the screen, making it easy to generate a hard copy of your reports. The "Appointment Totals" tab holds the key insights you might be looking for. This tab displays two informative tables:

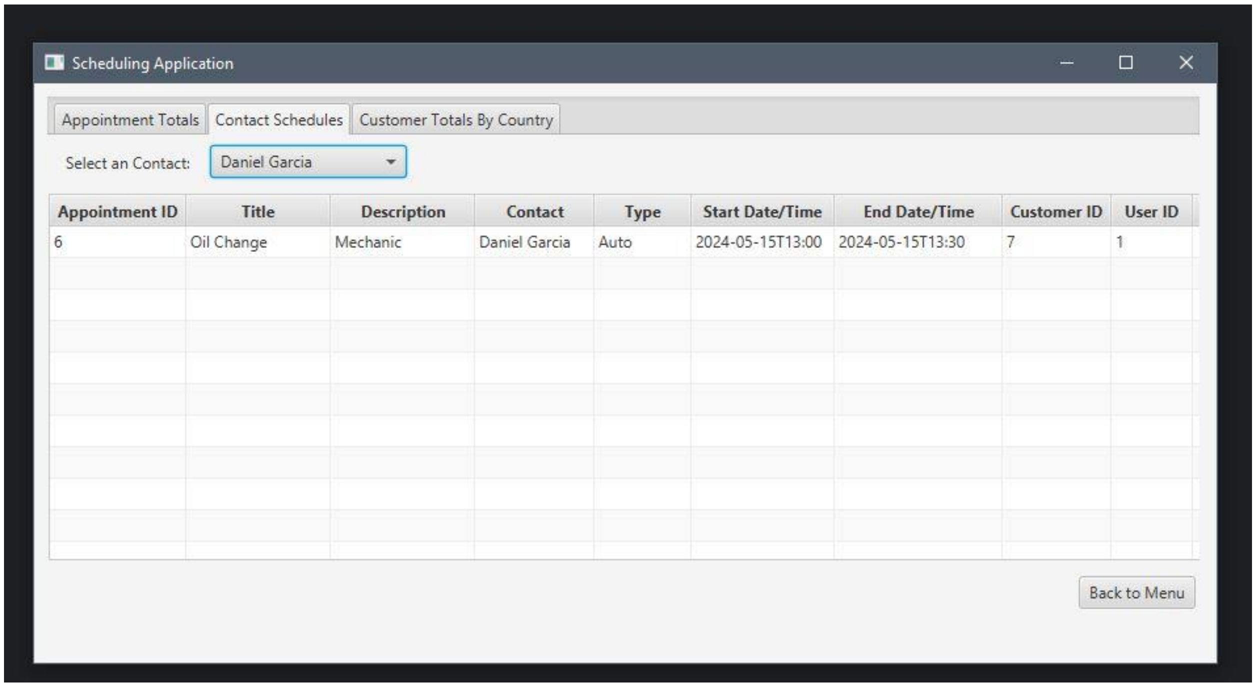
- Appointment Type Totals: This table, located on the left side, provides a breakdown of the total appointments categorized by their type.
- Appointment Totals by Month**:** The table on the right side focuses on a monthly view, summarizing the total number of appointments scheduled for each month.



Appointment ID	Title	Description	Location	Contact	Type	Start Date/Time	End Date/Time	Customer ID	User ID
5	Doctor A...	Check Up	Rocky Mont	Li Lee	Medical	2024-05-08T09:00	2024-05-08T10:00	7	1
6	Oil Change	Mechanic	Apex	Daniel Garcia	Auto	2024-05-15T13:00	2024-05-15T13:30	7	1

Appointment Schedule for Contacts

The "Contact Schedules" tab within reports provides a detailed breakdown of appointments for each contact. Select this tab to access this functionality. A drop-down menu positioned above the table allows you to easily switch between different contacts and view their specific appointment schedules. The table itself displays all appointments assigned to the chosen contact. If needed, you can print this schedule using the available printing options. Finally, a "Back to Menu" button conveniently located at the bottom right corner allows you to return to the main menu for further navigation within the Reports section.

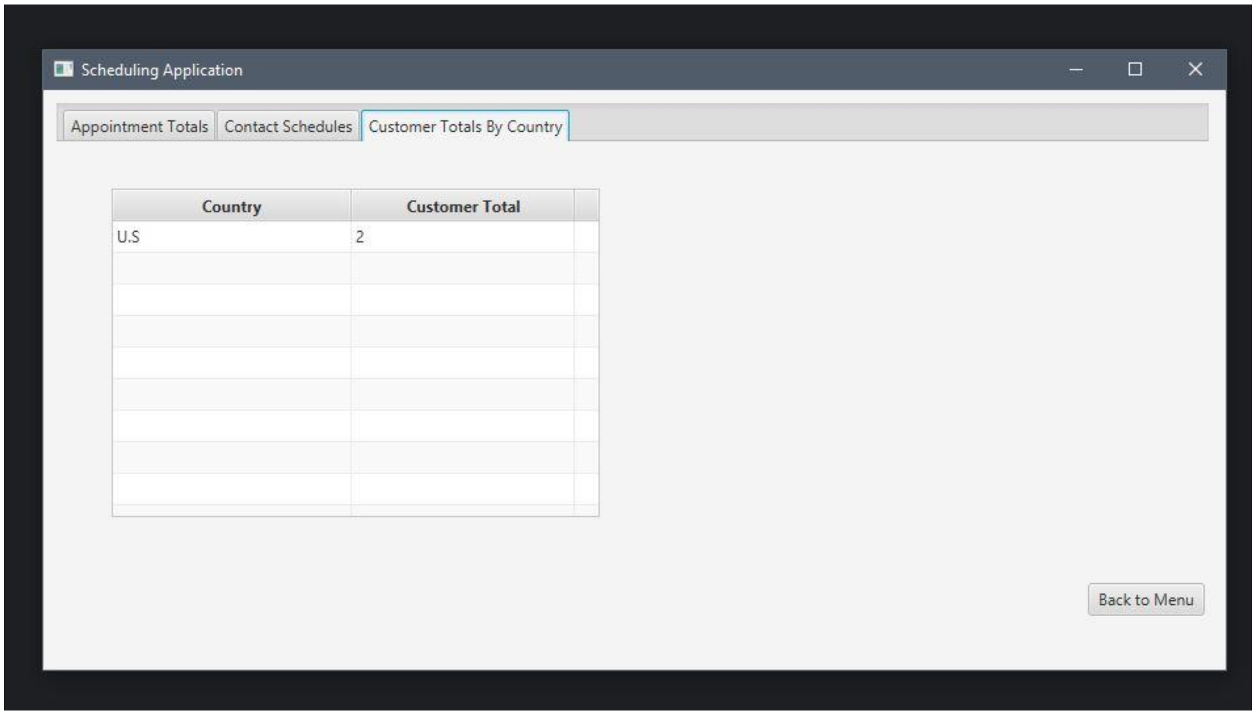


Select an Contact: Daniel Garcia

Appointment ID	Title	Description	Contact	Type	Start Date/Time	End Date/Time	Customer ID	User ID
6	Oil Change	Mechanic	Daniel Garcia	Auto	2024-05-15T13:00	2024-05-15T13:30	7	1

Customer Total By Country

This report contains the country and the total number of customers scheduled from that particular country. The total can be accessed within the application or printed if needed. In order to leave the screen select the “Back to Menu” button located on the bottom right under the table.



Country	Customer Total
U.S	2