Final Project Stage 2: Code Implementation and Testing

Total: 50 points
Due: November 30, 11:59 pm

D1. Source Code Folder: Include all program files (Python scripts, modules, assets, etc.) in a well-organized structure.
Submitted this document as well as the python and txt files necessary to run my system.

D2. System Implementation Report (PDF): Summarize your code architecture and key decisions, including:

1. **System overview and class structure.**

The nail salon booking system is organized into classes, a central manager, and text files for storage. It follows a clear structure where data and business rules are encapsulated by the classes, the central manager handles all operations, data storage, and retrieval and the text files hold the data.

Core Model Classes: These classes represent the fundamental entities of the business. They primarily hold data and define relationships.

Class	Description	Key Attributes
Client	Represents a salon customer.	client_id, name, phone.
Technician	Represents a nail professional.	tech_id, name, availability (dict), schedule (dict).
Appointment	A booking instance linking a client and technician to a specific service.	appt_id, date, time, client (obj), technician (obj), service, price, status.

Controller Class

Class	Description	Key Responsibilities
BookingManager	The central controller and data repository.	Manages all dictionaries (clients, technicians, appointments), handles ID generation, implements all business logic (booking, cancellation), and manages persistence (I/O).

Text Files
Data persistence is achieved by mapping in-memory objects to CSV-formatted text files:
- clients.txt: Stores all Client records.
- technicians.txt: Stores all Technician records.
- appointments.txt: Stores all Appointment records.

2. **Applied design pattern(s) and their purpose.**
The primary pattern used to organize the system is the Model-View-Controller (MVC).

Model-View-Controller (MVC) Pattern: This pattern separates the application into three interconnected parts, enhancing modularity and maintainability.

MVC Component	Code Implementation	Purpose
Model	Client, Technician, Appointment classes.	Manages the data, state, and business logic (e.g., how an appointment is defined, service prices). These classes are independent of the interface.
Controller	BookingManager class.	Acts as the intermediary. It receives input from the View (menu functions) and executes model changes (e.g., calling book_appointment). It also manages the persistence layer.
View	main_menu, client_menu, technician_menu, and associated helper functions.	Responsible for displaying data to the user (e.g., printing schedules, finding slots) and handling user input.

3. How your implementation fulfills Stage 1 requirements.

The implementation of the nail salon booking system fulfills the stage 1 requirements of digitizing the booking in nail salons. It allows clients and technicians to create a user with an ID and log in with their IDs. Clients can book, view and cancel appointments and technicians can add, remove and view schedule times and bookings. Functions like find_open_slots() allow the users to view the schedule and book in the same place.

D3. Testing Evidence: Provide unittest results or screenshots that confirm the correctness of your implementation.

Provided manual testing screenshots of the client and technician user experiences:

```
SUCCESS: Loaded 2 clients from clients.txt.          --- Welcome, Bret (Client Menu) ---
SUCCESS: Loaded 3 technicians from technicians.txt.  1. Book New Appointment
SUCCESS: Loaded 1 appointments from appointments.txt.2. View My Appointments
                                                     3. Cancel Appointment
                                                     4. Back to Main Menu
======================================               Enter choice (1-4): 2
        NAIL SALON BOOKING SYSTEM
======================================
                                                     --- Your Appointments ---
                                                     You have no appointments booked.
--- Main Menu ---
1. I am a Client                                     --- Welcome, Bret (Client Menu) ---
2. I am a Technician                                 1. Book New Appointment
3. Exit System                                       2. View My Appointments
Enter your choice (1-3): 1                            3. Cancel Appointment
                                                     4. Back to Main Menu
--- Client Login/Creation ---                        Enter choice (1-4): 1
1. Log In with Existing ID
2. Create New Client Account                         --- Service Selection ---
3. Back to Main Menu                                 1. Manicure ($45.00)
Enter choice (1-3): 1                                2. Pedicure ($45.00)
Current Clients:                                     3. Gel Manicure ($55.00)
  - C101 - Cathy Smith                               4. Gel Pedicure ($55.00)
  - C102 - Bret                                      Select a service (1-4): 2
Enter your Client ID (e.g., 101): 102               Selected: **Pedicure** for **$45.00**
                                                     Enter date to check (YYYY-MM-DD, e.g., 2025-11-21): 2025-12-12
--- Welcome, Bret (Client Menu) ---
1. Book New Appointment                              --- Open Slots on 2025-12-12 ---
2. View My Appointments                              No open slots found for that date.
3. Cancel Appointment
4. Back to Main Menu
Enter choice (1-4): 2
```

```
--- Welcome, Bret (Client Menu) ---               --- Welcome, Rose (Technician Menu) ---
1. Book New Appointment                            1. View My Schedule
2. View My Appointments                            2. Add Availability Slot
3. Cancel Appointment                              3. Remove Availability Slot
4. Back to Main Menu                               4. Back to Main Menu
Enter choice (1-4): 4                              Enter choice (1-4): 1
Returning to Main Menu.

                                                   --- Rose's Schedule & Availability ---
--- Main Menu ---
1. I am a Client                                   **Current Availability Slots (Open for Booking):**
2. I am a Technician                                 No future availability set.
3. Exit System
Enter your choice (1-3): 2                          **Booked/Past Appointments:**
                                                     --- 2025-12-01 ---
                                                       11:00 | Client: Cathy Smith (ID: C101) | Status: Booked
--- Technician Login/Creation ---
1. Log In with Existing ID                         --- Welcome, Rose (Technician Menu) ---
2. Create New Technician Profile                   1. View My Schedule
3. Back to Main Menu                               2. Add Availability Slot
Enter choice (1-3): 1                              3. Remove Availability Slot
Current Technicians:                               4. Back to Main Menu
  - T201 - Alice                                   Enter choice (1-4): 2
  - T202 - Bob                                      Enter date to add (YYYY-MM-DD): 2025-12-12
  - T203 - Rose                                     Enter time to add (HH:MM, e.g., 15:30): 13:00
Enter your Technician ID (e.g., 201): 203          SUCCESS: Slot 2025-12-12 @ 13:00 added for Rose.

--- Welcome, Rose (Technician Menu) ---            --- Welcome, Rose (Technician Menu) ---
1. View My Schedule                                1. View My Schedule
2. Add Availability Slot                           2. Add Availability Slot
3. Remove Availability Slot                        3. Remove Availability Slot
4. Back to Main Menu                               4. Back to Main Menu
Enter choice (1-4): 1                              Enter choice (1-4): 2
```

```
--- Welcome, Rose (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
Enter choice (1-4): 2
Enter date to add (YYYY-MM-DD): 2025-12-14
Enter time to add (HH:MM, e.g., 15:30): 10:00
SUCCESS: Slot 2025-12-14 @ 10:00 added for Rose.

--- Welcome, Rose (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
Enter choice (1-4): 1

--- Rose's Schedule & Availability ---

**Current Availability Slots (Open for Booking):**
  2025-12-12: 13:00
  2025-12-14: 10:00

**Booked/Past Appointments:**
  --- 2025-12-01 ---
    11:00 | Client: Cathy Smith (ID: C101) | Status: Booked

--- Welcome, Rose (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
```

```
--- Welcome, Rose (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
Enter choice (1-4): 4
Returning to Main Menu.

--- Main Menu ---
1. I am a Client
2. I am a Technician
3. Exit System
Enter your choice (1-3): 2

--- Technician Login/Creation ---
1. Log In with Existing ID
2. Create New Technician Profile
3. Back to Main Menu
Enter choice (1-3): 2
Enter your Name: Wendy Randall

SUCCESS: New Technician created and saved: Wendy Randall (ID: T204)

--- Welcome, Wendy Randall (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
Enter choice (1-4): 2
Enter date to add (YYYY-MM-DD): 2025-12-01
Enter time to add (HH:MM, e.g., 15:30): 10:00
SUCCESS: Slot 2025-12-01 @ 10:00 added for Wendy Randall.
```

```
Enter choice (1-4): 2
Enter date to add (YYYY-MM-DD): 2025-12-01
Enter time to add (HH:MM, e.g., 15:30): 10:00
SUCCESS: Slot 2025-12-01 @ 10:00 added for Wendy Randall.

--- Welcome, Wendy Randall (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
Enter choice (1-4): 2
Enter date to add (YYYY-MM-DD): 2025-12-02
Enter time to add (HH:MM, e.g., 15:30): 10:00
SUCCESS: Slot 2025-12-02 @ 10:00 added for Wendy Randall.

--- Welcome, Wendy Randall (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
Enter choice (1-4): 1

--- Wendy Randall's Schedule & Availability ---

**Current Availability Slots (Open for Booking):**
  2025-12-01: 10:00
  2025-12-02: 10:00

**Booked/Past Appointments:**
No appointments currently booked.
```

```
**Booked/Past Appointments:**
No appointments currently booked.

--- Welcome, Wendy Randall (Technician Menu) ---
1. View My Schedule
2. Add Availability Slot
3. Remove Availability Slot
4. Back to Main Menu
Enter choice (1-4): 4
Returning to Main Menu.

--- Main Menu ---
1. I am a Client
2. I am a Technician
3. Exit System
Enter your choice (1-3): 1

--- Client Login/Creation ---
1. Log In with Existing ID
2. Create New Client Account
3. Back to Main Menu
Enter choice (1-3): 2
Enter your Name: Ty Jones
Enter your Phone Number: 7021345678

SUCCESS: New Client created and saved: Ty Jones (ID: C103)
```

```
SUCCESS: New Client created and saved: Ty Jones (ID: C103)

--- Welcome, Ty Jones (Client Menu) ---
1. Book New Appointment
2. View My Appointments
3. Cancel Appointment
4. Back to Main Menu
Enter choice (1-4): 1

--- Service Selection ---
1. Manicure ($45.00)
2. Pedicure ($45.00)
3. Gel Manicure ($55.00)
4. Gel Pedicure ($55.00)
Select a service (1-4): 3
Selected: **Gel Manicure** for **$55.00**
Enter date to check (YYYY-MM-DD, e.g., 2025-11-21): 2025-12-01

--- Open Slots on 2025-12-01 ---
  Wendy Randall (ID: T204) at 10:00
Enter Technician ID (e.g., 201) for booking: 204
Enter desired time (HH:MM, e.g., 10:00): 10:00

SUCCESS: Booking Successful!
[3002] 2025-12-01 @ 10:00 | Service: Gel Manicure ($55.00)
    - Technician: Wendy Randall | Client: Ty Jones
```

```
SUCCESS: Booking Successful!
[3002] 2025-12-01 @ 10:00 | Service: Gel Manicure ($55.00)
    - Technician: Wendy Randall | Client: Ty Jones

--- Welcome, Ty Jones (Client Menu) ---
1. Book New Appointment
2. View My Appointments
3. Cancel Appointment
4. Back to Main Menu
Enter choice (1-4): 4
Returning to Main Menu.

--- Main Menu ---
1. I am a Client
2. I am a Technician
3. Exit System
Enter your choice (1-3): 1

--- Client Login/Creation ---
1. Log In with Existing ID
2. Create New Client Account
3. Back to Main Menu
Enter choice (1-3): 1
Current Clients:
  - C101 - Cathy Smith
  - C102 - Bret
  - C103 - Ty Jones
Enter your Client ID (e.g., 101): 102
```

```
Enter choice (1-3): 1
Current Clients:
  - C101 - Cathy Smith
  - C102 - Bret
  - C103 - Ty Jones
Enter your Client ID (e.g., 101): 102

--- Welcome, Bret (Client Menu) ---
1. Book New Appointment
2. View My Appointments
3. Cancel Appointment
4. Back to Main Menu
Enter choice (1-4): 1

--- Service Selection ---
1. Manicure ($45.00)
2. Pedicure ($45.00)
3. Gel Manicure ($55.00)
4. Gel Pedicure ($55.00)
Select a service (1-4): 2
Selected: **Pedicure** for **$45.00**
Enter date to check (YYYY-MM-DD, e.g., 2025-11-21): 2025-12-12

--- Open Slots on 2025-12-12 ---
  Rose (ID: T203) at 13:00
Enter Technician ID (e.g., 201) for booking: 203
Enter desired time (HH:MM, e.g., 10:00): 13:00
```

```
--- Open Slots on 2025-12-12 ---
  Rose (ID: T203) at 13:00
Enter Technician ID (e.g., 201) for booking: 203
Enter desired time (HH:MM, e.g., 10:00): 13:00

SUCCESS: Booking Successful!
[3003] 2025-12-12 @ 13:00 | Service: Pedicure ($45.00)
    - Technician: Rose | Client: Bret

--- Welcome, Bret (Client Menu) ---
1. Book New Appointment
2. View My Appointments
3. Cancel Appointment
4. Back to Main Menu
Enter choice (1-4): 2

--- Your Appointments ---
[3003] 2025-12-12 @ 13:00 | Service: Pedicure ($45.00)
    - Technician: Rose | Client: Bret

--- Welcome, Bret (Client Menu) ---
1. Book New Appointment
2. View My Appointments
3. Cancel Appointment
4. Back to Main Menu
Enter choice (1-4): 4
Returning to Main Menu.
```

```
--- Welcome, Bret (Client Menu) ---
1. Book New Appointment
2. View My Appointments
3. Cancel Appointment
4. Back to Main Menu
Enter choice (1-4): 4
Returning to Main Menu.

--- Main Menu ---
1. I am a Client
2. I am a Technician
3. Exit System
Enter your choice (1-3): 3

Thank you for using the Nail Salon Booking System. Goodbye!

Process finished with exit code 0
```