



**Institute of Arts and Sciences (Chiniot Campus)
Govt College University Faisalabad**

Software Requirement Specification

(SRS Document)

For

Cinema Complex System

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of this document is to provide a detailed description of the Cinema complex System, outlining its features, functionalities, and requirements. It serves as a guide for developers, testers, and other stakeholders involved in the development and maintenance of the system.

1.2 Intended Audience

This document is intended for:

- *Developers*
- *Testers*
- *Project Managers*
- *Stakeholders involved in the Cinema Complex System*

Readers are advised to review the document thoroughly to understand the requirements and constraints of the system.

1.3 Project Scope

The Cinema Complex System aims to provide a comprehensive solution for managing the operations of a cinema complex. The system covers various functionalities to enhance the overall efficiency of the cinema's day-to-day activities.

1.4 Definitions

Managerial Staff

As cinema managers, our job involves handling movie listings, making sure they're up-to-date and appealing. We also take care of employee-related tasks like registration, attendance tracking, and staff changes. We keep an eye on how things are going, looking at numbers and reports to improve how the cinema works. Our goal is to make sure people have a great time watching movies at our cinema.

Front Desk Personnel

Front desk staff at the cinema are the team members directly interacting with customers, handling various responsibilities to ensure a smooth and enjoyable experience. Their main tasks include processing customer reservations, generating tickets, and addressing any inquiries or concerns customers may have.

Marketing Team

The specialized team dedicated to cinema promotions and customer engagement is focused on enhancing the overall experience for moviegoers. Their responsibilities encompass monitoring the popularity of movies, collaborating on promotional activities to attract audiences, and analyzing customer feedback to improve offerings.

Customer

As end-users utilizing cinema services, our responsibilities revolve around making the most of the movie-watching experience. This includes reserving movie slots to secure our preferred showtimes, purchasing tickets for the chosen films, and regularly checking movie schedules and availability. We play a crucial role in the cinema community by providing valuable feedback on our movie experiences, contributing to the continuous improvement of services and ensuring that our cinematic outings are enjoyable and tailored to our preferences.

Input

Input is the data or information that a system receives from the external environment. It serves as the raw material for processing within a system. In a computer program, user keyboard entries, mouse clicks, or data from sensors can be considered as input.

Output

Output is the result or information produced by a system or process after the input has been processed. In a computer program, the output could be displayed on a screen, printed on paper, or saved in a file.

Prompt

Prompt refers to a message or indicator that prompts the user to provide input. It's a way for the program to communicate with the user.

2. Overall Description

2.1 Product Perspective

The Cinema Complex System operates independently as a standalone product, managing movie-related activities within the cinema. It interfaces with external databases or services for additional functionalities, such as movie data retrieval or user authentication. The system doesn't rely on integration with other external systems, ensuring autonomy and efficient cinema management.

2.2 Product Features

1. **Movie Management**

- *Add, modify, and delete movie records*
- *Display the list of movies with details*
- *Sort movies based on name, genre, or price*

2. **Employee Management**

- *Register, modify, and delete employee records*
- *Display the list of employees with details*
- *Mark attendance and manage attendance records*

3. **Customer Reservation System**

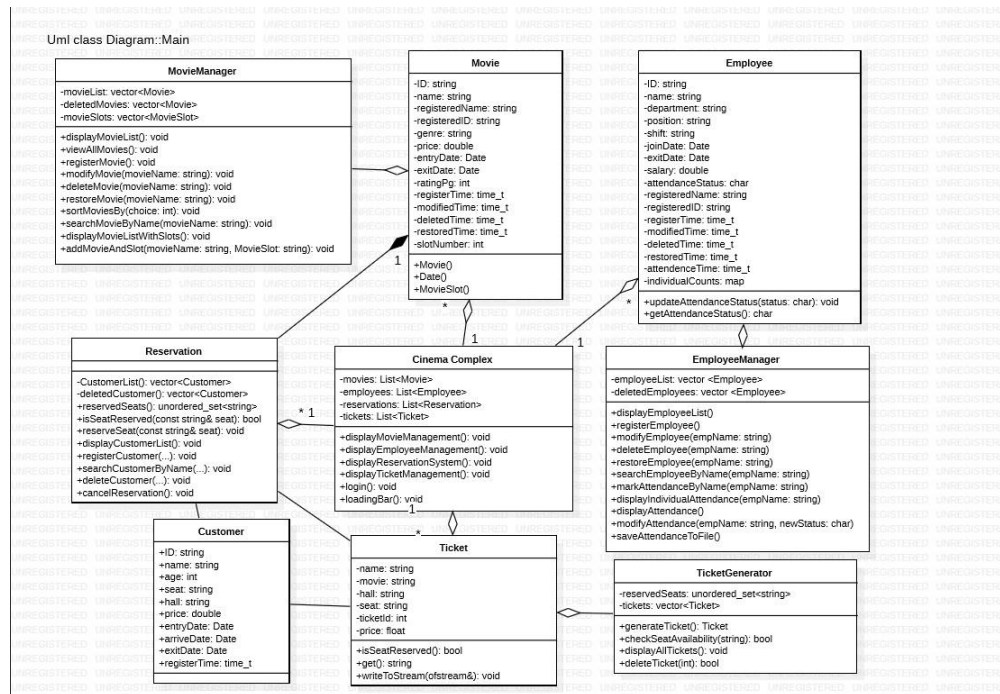
- *Register and search customer reservations*
- *Display customer lists, individual reservations, and attendance*
- *Cancel customer reservations*

4. **Customer Ticket System**

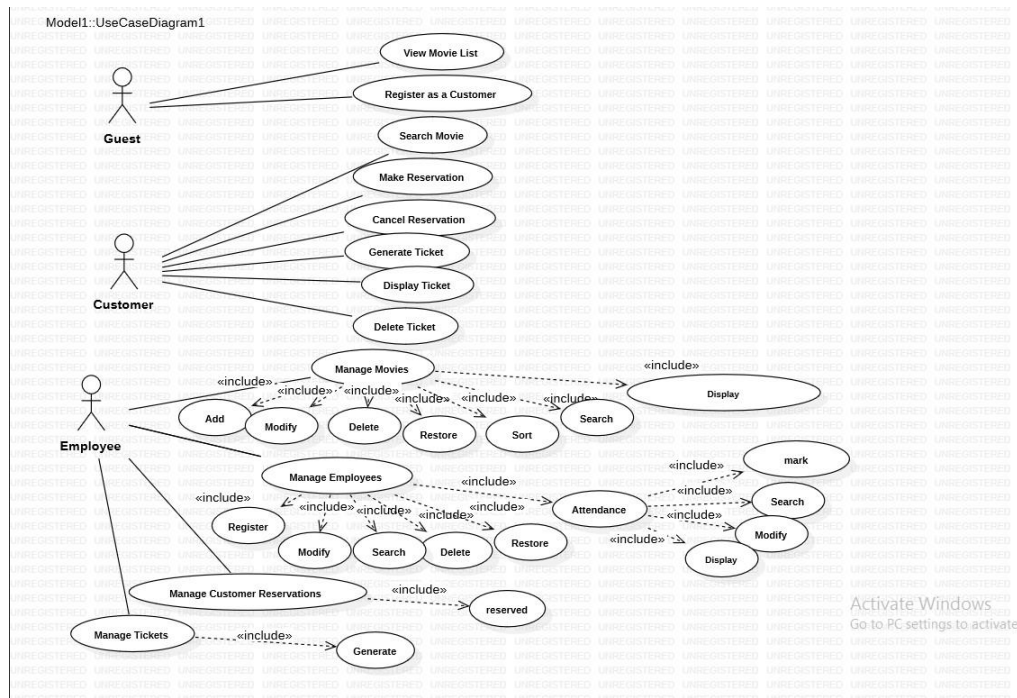
- *Generate customer tickets with details*
- *Display all generated tickets*
- *Delete customer tickets by ticket ID*

2.3 User Classes and Characteristics

Class Diagram



Use Case Diagram



2.4 Operating Environment

The system will be compatible with Windows operating systems.

2.5 Design and Implementation Constraints

- *The system will be developed using C++ Programming Language.*
- *The database will be simple txt files.*
- *Compatibility with latest version of C++.*

2.6 User Documentation

Comprehensive user documentation will be provided, including user manuals and guides.

○ Concepts

Object-Oriented Programming (OOP) Principles:

- **Class**

Classes Used:

- *Core entities within the system, such as CinemaManager, MovieManager, EmployeeManager, Reservation, TicketGenerator, and others, adhering to object-oriented programming principles.*
- **Explanation:** *A class is a user-defined data type that we can use in our program, and it works as an object constructor, or a "blueprint" for creating objects*

- **Encapsulation**

- **Private Members:** *Various data members in classes are marked as private, encapsulating the internal details of each class.*
- **Explanation:** *Encapsulation is the bundling of data and the methods (functions) that operate on the data into a single unit, i.e., a class. This helps in controlling access to the data by providing access specifiers (public, private, protected).*

- **Abstraction**

- *Employment of abstract classes like MovieManager for essential functionalities, exposing key details for external use.*
- **Explanation:** *Abstraction is the concept of simplifying complex systems by modeling classes based on the essential properties and behaviors.*

- **Inheritance**

- *Establishment of "is-a" relationships, exemplified by classes like EmployeeManager inheriting from MovieManager and TicketGenerator inheriting from Reservation.*
- **Explanation:** *Inheritance is the mechanism by which one class can inherit properties and behavior from another class promoting code reusability.*

- **Composition**

- *Integration of objects from different classes, for instance, MovieManager within CinemaManager, highlighting the composition design principle.*
- **Explanation:** *Composition refers to the design principle where a class is composed of or contains objects of other classes, enabling the creation of more complex and reusable structures.*

- **Aggregation**

- *Representation of "has-a" relationships in various classes, such as EmployeeManager and MovieManager, containing objects of Employee and Movie, respectively.*
- **Explanation:** *Aggregation in represents a "has-a" relationship between classes, where one class contains another, but the contained class maintains independence.*

Software Engineering Principles:

- **Development Approach**

- *Embracing an iterative development model for adaptability and ongoing refinement.*

- **DRY (Don't Repeat Yourself)**

- *Avoiding duplicating code by encapsulating common functionalities within classes and methods.*

- **Modularity**

- **Separation of Concerns:** *exemplified by different classes focusing on specific functionalities like movie management and employee management.*

- **Code Reusability**

- **Inheritance for Reusability:** *Inheritance is used to reuse the functionality.*

- **Maintainability**

- **Structured Code:** *The code is organized into classes, functions, and headers, enhancing readability and maintainability.*

- **Scalability**

- **Dynamic Memory Usage:** *Implementation of dynamic memory usage, especially with vectors, for scalability in managing various system components.*

- **Readability**

- **Descriptive Identifiers:** *Variable and function names are chosen descriptively, contributing to code readability.*

- **File Organization**

- **Usage:** Header files (*MovieManager.h*, *EmployeeManager.h*, *Reservation.h*, *TicketGenerator.h*, *CinemaManager.h*), Separation of Concerns.
- **Explanation:** The code is organized into header files and source files, following good practices for file organization and separation of concerns.

- **Documentation**

- **Usage:** Comments, descriptive variable names.
- **Explanation:** The code includes comments that provide information about the purpose of the code blocks. Descriptive variable and function names also contribute to self-documenting code.

Other Concepts

- **Vectors**

- Vectors are used for storing and managing dynamic arrays of data. Vectors are used in several places for offering flexibility in handling diverse system functionalities.
- **Explanation:** Vectors provide dynamic arrays with automatic resizing.

- **Algorithm**

- The algorithm header is used for sorting movies based on the movies name, price, genre.
- **Explanation:** The algorithm header provides a collection of functions (algorithms) to perform operations on sequences of elements. In this software, sort is used to sort the *playerScores* vector based on the scores, using the custom comparison function *compares cores*.

- **File Handling**

- Incorporation of file handling mechanisms for persistent data storage, maintaining Separation of concerns.

- **Exception Handling**

- To guarantee code robustness, we used error-handling techniques such as file existence checks and appropriate user input validation. For increased dependability, confirm the existence of the file before opening it, respond properly to successful actions, and manage invalid user input.

2.7 Assumptions and Dependencies

- *Users are assumed to have access to a computer with a Windows operating system.*
- *The system relies on standard input and output for user interactions.*
- *The console-based application assumes that users are familiar with basic command-line interactions.*
- *Dependencies include the availability of the C++ runtime environment on users' machines.*
- *Any changes in the Windows environment or command-line interface may affect the application's functionality.*

3. System Features

3.1.1 Functional Requirements

REQ-1: Movie Management

- *Display Movies*

The system shall display a list of current movies.

- *Register Movie*

Users can register new movies with details such as name, genre, and price.

- *Modify Movie*

The system allows modification of existing movie information.

- *Delete/Restore Movie*

Users can delete or restore movies.

- *Sort/Search Movies*

Movies can be sorted and searched for better organization.

REQ-2: Employee Management

- *Register Employee*

Users can register new employees with relevant details.

- *Display Employee List*

The system shall maintain a list of current employees.

- *Modify Employee*

Users can modify or update employee information.

- *Delete/Restore Employee*

Employees can be deleted or restored.

Search Employee:

Users can search for employees by name.

- *Employee Attendance*

The system shall track and manage employee attendance.

REQ-3: Customer Reservation System

- *Register Reservation*

Users can register customer reservations for movie slots, including seat selection.

- *Display Reservations*

The system shall display a list of current customer reservations.

- *Search Customer*

Users can search for customers by name.

- *Delete/Cancel Reservation*

Reservations can be deleted or canceled.

REQ-4: Ticket Management

- *Generate Ticket*

The system generates tickets for confirmed customer reservations.

- *Display Tickets*

A list of all generated tickets is displayed.

- *Delete Ticket*

Users can delete tickets based on ticket ID.

REQ-5: User Authentication

- *Login Mechanism*

*The system shall require users to log in with a valid username and password.
Successful authentication grants access to system functionalities*

REQ-6: Main Menu Navigation

- *Menu Options*

The main menu provides options for movie management, employee management, customer reservations, ticket management, and exit.

Users can navigate between different modules seamlessly.

REQ-7: Loading Bar

- *Post-Login Loading:*

After successful login, a loading bar simulates system loading for a better user experience.

4. External Interface Requirements

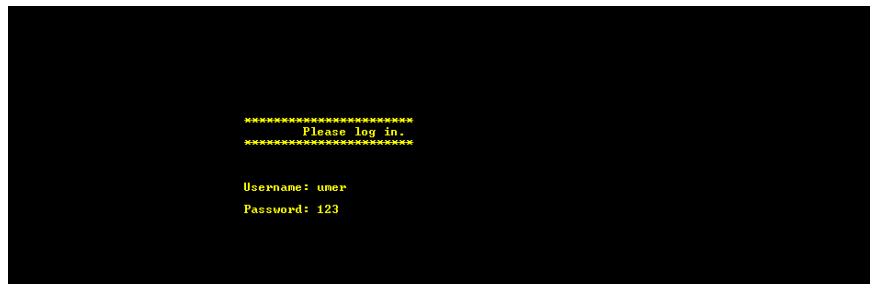
4.1 User Interfaces

The system will have a console-based interface suitable for interaction within a command-line environment on Windows.

1. Cinema Interface

Log In Bar

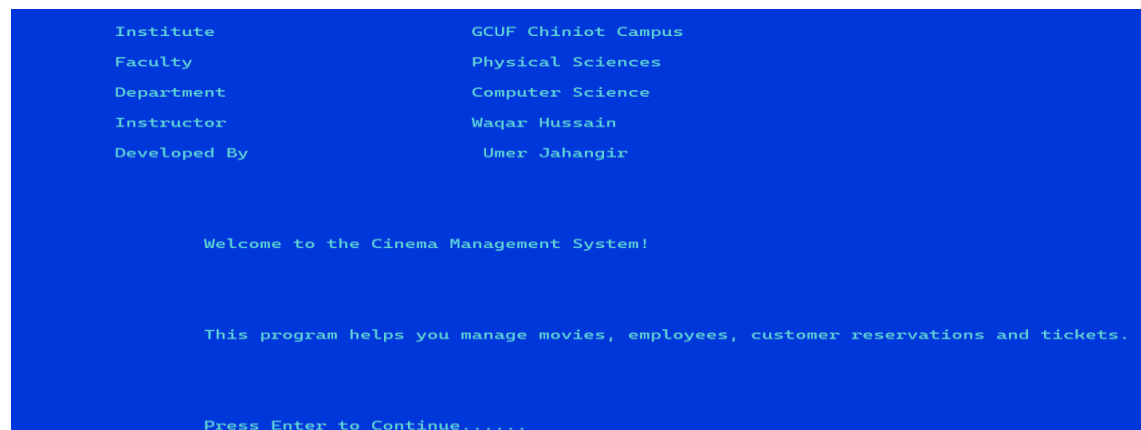
First of all, when you use the program, you will asked to enter username and password.



- **Username/Email Field:** Users enter their registered username or email.
- **Password Field:** Secure entry for user passwords.

Getting Started

In this you will be greeted with a welcome screen displaying the Project title and a brief description. Press "Enter" to proceed to the main menu.



Main Menu

In the main menu, you are able to see the following options:

```

Main Menu
*****
1. Movie Management
2. Employee Management
3. Customer Reservation System
4. Customer Ticket System
5. Exit
*****
Enter your choice:

```

1. **Movie Management:** Enter 1 go to the movie menu.
2. **Employee Management:** Enter 2 go to the employee menu.
3. **Reservation system:** Enter 3 to go customer reservation menu.
4. **Ticket system:** Enter 4 to go customer ticket menu.
5. **Log Out:** Enter 5 to exit cinema complex system program.

1. Movie Management Menu

Upon entering '1' into the main menu, you are able to see the following options for movie management.

```

=== Movie Management System ===
*****
1. Display Movie List
2. Register a Movie
3. Modify a Movie
4. Delete a Movie
5. Restore a Movie
6. Sort Movies
7. Search Movies
8. Display Movies Slot
9. Display All Movies
10. Exit
*****
Enter your choice:

```

• Register Movie

Upon entering '2' into the movie management menu, you are able to register a movie.

```

Movie register time: Wed Jan 17 11:05:55 2024
Enter Movie ID: 12
Enter movie name: avenger
Enter slot number for the movie: 1
Do you want to proceed with the Genre (Y/N)? y
Enter movie genre (as a string): action
Enter movie price: 30
Do you want to proceed with the Release Date (Y/N)? y
Enter movie release date (DD MM YYYY): 12 12 2020
Do you want to proceed with Goes Out Date (Y/N)? y
Enter the date this movie goes out of cinema (DD MM YYYY): 3 1 2021
Enter viewer rating out of 10: 10
Movie details saved to file successfully!

```

After register a movie it asked to register other movie.

```

Do you want to register another movie? (Y/N): n

Returning to Movie Management menu.
Press Enter to continue.

```

If you want to register another movie press 'y' and if another movie name match to previous register movie then it display.

```
Do you want to register another movie? (Y/N): y
Movie register time: Wed Jan 17 11:17:37 2024

Enter Movie ID: 11
Enter movie name: openhiemer
You have already registered a movie with the name: openhiemer
Do you want to change the movie name? (Y/N): n
Returning to Movie Management menu.
Press Enter to continue.
```

- **Display Movie**

Upon entering '2' into the movie management menu, you are able to see all registered movie.

```
=====
Movie ID!      Name!      Genre!      Price!      Rel. Date!      Exp. Date!      Rating!      Slot!
=====
1 12!          avenger!    action!     30!          12 D / 12 M / 2020 Y!          3 D / 1 M / 2021 Y!          10!          11
Movie was registered at: Wed Jan 17 11:07:01 2024
Movie is not modified yet.
=====
Total Movies: 1
```

- **Modify Movie**

Upon entering '3' into the movie management menu, you are able to modify a movie.

```
Enter the name of the movie you want to modify:
openhiemer
Enter new details for movie: openhiemer
Movie modified at time: Wed Jan 17 11:23:54 2024

What do you want to modify?
1. Movie ID
2. Name
3. Genre
4. Price
5. Release Date
6. Expiry Date
7. Rating (viewer reviews)
8. Return to main menu
Enter choice: 1
```

- **Delete Movie**

Upon entering '4' into the movie management menu, you are able to delete a movie.

```
Enter movie name to delete:
openhiemer
Movie 'openhiemer' deleted successfully.
Deleted Time: Wed Jan 17 11:28:10 2024

Do you want to delete another movie? (Y/N):
```


- **Restore Movie**

Upon entering '5' into the movie management menu, you are able to restore a deleted movie.

```
Enter movie name to Restore:
openheimer
Movie 'openheimer' restored successfully.
Restored Time: Wed Jan 17 11:33:28 2024

Movie details deleted from file successfully!
```

- **Sort Movie**

Upon entering '6' into the movie management menu, you are able to sort registered movies in display movie menu.

```
Sort movies by:
1. Name
2. Genre
3. Price
Enter your choice: 1
Movies sorted by name sucessfully.
```

- **Search Movie**

Upon entering '7' into the movie management menu, you are able to search registered movies in display movie menu.

```
Enter movie name to search:
avenger
Movie found:
Movie Name: avenger
Movie ID: 12
Genre: action
Price: 30
Release Date: 12/12/2020
Goes Out Date: 3/1/2021
Viewer Rating: 10/10
Registered Time: Wed Jan 17 11:07:01 2024
Movie has not been modified yet.

Do you want to search for another movie? (Y/N): n

Returning to Movie Management menu.
Press Enter to continue.
```

- **Display Movie Slot**

Upon entering '8' into the movie management menu, you are able to see registered movies slot number.

```
Available Movies:
Movie: avenger ! Slot: 1
Movie: openheimer ! Slot: 2
Movie slots saved to file successfully!
```

2. Employee Management Menu

Upon entering '2' into the main menu, you are able to see the following options for employee management.

```

=== Employee Management System ===
*****
1. Register an employee
2. Display employee list
3. Modify a employee
4. Delete a employee
5. Restore a employee
6. Search a employee
7. Attendance of employee
8. Exit
*****
Enter your choice: 2

```

- **Register Employee**

Upon entering '1' into the employee menu, you are able to register a employee.

```

Employee register time: Wed Jan 17 11:49:09 2024
Enter Employee ID: 22
Enter employee name: Ali
Enter employee department: Hall
Enter employee duty Shift: night
Enter employee salary: 3000
Do you want to enter the join Date (Y/N)? y
Enter Employee join date (DD MM YYYY): 12 12 2004
Do you want to enter Exit or Left Date (Y/N)? n
Employee details saved successfully!

```

- **Display Employee list**

Upon entering '2' into the employee menu, you are able to see register a employee.

```

*****
ID: Name|Department|Salary|Join Date|Left Date|Duty Shift|Attendance|
1 22| Ali| Hall| 3000| 12 D /12 M /2004 Y | 0 D / 0 M / 0 Y | ight| N|
Employee was registered at: Wed Jan 17 11:49:54 2024
Employee is not modified yet.
*****
Total Employees: 1

```

- **Modify Employee**

Upon entering '3' into the employee menu, you are able to modify register employee.

```

Enter employee name to modify: ali
Enter new details for employee: Ali
Employee modified at time: Wed Jan 17 11:55:13 2024
What do you want to modify?
1. Employee ID
2. Employee Name
3. Employee Department
4. Employee Salary
5. Employee Join Date
6. Employee Left Date
7. Employee Shift Duty
8. Return to main menu
Enter choice: 3

```

- **Delete Employee**

Upon entering '4' into the employee menu, you are able to delete a register employee.

```
Enter employee name to delete:
Ali
Employee 'Ali' deleted successfully.
Deleted Time: Wed Jan 17 11:58:27 2024
Employee details deleted from file successfully!
Do you want to delete another employee? (Y/N):
```

- **Restore Employee**

Upon entering '5' into the employee menu, you are able to restore a delete employee.

```
Enter employee name to Restore:
Ali
Employee 'Ali' restored successfully.
Restored Time: Wed Jan 17 12:02:18 2024
Employee details restored to file successfully!
```

- **Search Employee**

Upon entering '6' into the employee menu, you are able to search employee.

```
Enter employee name to search:
Ali
Employee found:
Employee Name: Ali
Employee ID: 22
Department: Hall
Position:
Salary: 30000
Join Date: 12/12/2004
Duty Shift: night
Employee Attendance Status: NI
Total Presents: 0
Total Absents: 0
Total Leaves: 0
Total Employee Attendance: 0
Employee was registered at: Wed Jan 17 11:49:54 2024
Modified Time: Wed Jan 17 11:56:32 2024
Do you want to search for another employee? (Y/N):
```

- **Attendance Employee**

Upon entering '7' into the employee menu, you are able to see following option.

```
***** Attendance Menu Employees *****
1. Mark Attendance
2. Search Attendance
3. Display Attendance
4. Modify Attendance
5. Save Attendance
6. Exit Attendance Menu
Enter your choice:
```

3. Customer Reservation System Menu

Upon entering '3' into the main menu, you are able to see the following options for Customer Reservation System.

```
== Customer Reservation System ==
=====
1. Display Customer List
2. Register a Customer
3. Search for a Customer
4. Delete a Customer
5. Cancel a Customer
6. Exit
=====
Enter your choice:
```

- Register Customer

Upon entering '2' into the reservation menu, you are able to register a reserved customer.

```
Customer register time: Wed Jan 17 12:15:08 2024
Enter Customer ID: 1
Enter customer name: yasin
Enter customer age: 22
Enter reserved hall: Please enter the reserved hall: 1w
Enter movie name: openheimer
Invalid movie. This movie is not available.
Do you want to enter another movie? <Y/N>: n
Enter reserved seat: Please enter the reserved seat: Enter reserved seat: 2
Do you want to proceed with the Entry Date <Y/N>? 1
Invalid choice. Please enter Y or N.
Do you want to proceed with the Entry Date <Y/N>? n
Do you want to proceed with Arrival the Date <Y/N>? n
Do you want to proceed with Expiry Date <Y/N>? n
Customer details saved to file successfully!
Customer details registered successfully!
```

Note: Search, delete and cancel same as other menu fuctions. But these function used in there for reservation.

4. Customer Ticket System Menu

Upon entering '4' into the main menu, you are able to see the following options for Customer ticket System.

```
=== Customer Ticket System ===
=====
1. Generate Ticket
2. Display Ticket
3. Delete Customer Tickets
4. Exit
=====
Enter your choice: 1
```

- **Generate Ticket**

Upon entering '1' into the ticket menu, you are able to generate a ticket for customer.

```
Enter customer name: san
Enter movie: avenger
Enter hall: 1
Enter desired seat: 1
Enter ticket ID: 1122
Enter price: 23
Ticket has been generated.
```

Notes: Delete and display same as other menu functions. But these functions are used in there for n ticket system.

4.2 Hardware Interfaces

The system will require computing hardware compatible with the Windows operating system.

4.3 Software Interfaces

The application relies on the Windows command-line interface for user interactions. it will use txt files as database.

4.4 Communications Interfaces

The application does not require external communication interfaces, as it operates within a standalone console environment.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The system shall respond to user actions promptly.

Loading times for data display and operations shall be optimized.

5.2 Safety Requirements

The system should ensure the security of user data stored locally on the machine.

5.3 Security Requirements

User authentication shall be secure, requiring a valid username and password.

Access control mechanisms shall ensure that only authorized users can perform specific actions.

5.4 Software Quality Attributes

Reliability: *The system should function without errors, providing a stable experience.*

Usability: *The console-based interface should be designed for ease of use, with clear prompts and instructions for users interacting via the command line.*