Declaration of Original Work for SC/CE/CZ2002 Assignment

We hereby declare that the attached group assignment has been researched, undertaken, completed and submitted as a collective effort by the group members listed below. We have honoured the principles of academic integrity and have upheld Student Code of Academic Conduct in the completion of this work. We understand that if plagiarism is found in the assignment, then lower marks or no marks will be awarded for the assessed work. In addition, disciplinary actions may be taken.

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Important notes:
1. Name must EXACTLY MATCH the one printed on your Matriculation Card.

<u>Design Considerations</u>

1. <u>Project Aim</u>

For this project, we are tasked to make a console based application: Movie Booking and Listing Management Application (MOBLIMA). It is an application to make online booking and purchase of movie tickets, sales reporting and listing movies. It will be used mainly by 2 categories of people: 1. Movie-goers 2. Cinema staff.

Assumptions were also given:

1. Single-User Application
2. 3 Cineplexes for demonstration
3. Currency in Singapore Dollars (inclusive of Goods and Tax Services(GST))
4. Simple login for staff
5. Payment always successful
6. No need for interface with external systems
7. Senior citizens can purchase online without validation of identity and age.

2. <u>MVC Model framework</u>

We have adopted the **Model View Controller (MVC)** Model framework. It helps us separate our classes into 3 different categories and implement our classes more easily. Each category has their own specific tasks to handle. For instance, Model handles data, View handles the layout and display, and Controller allows the View and Model to communicate with each other.

3. <u>Principles Used</u>

a. **Abstraction**

For the cinema staff, they only need to know the methods of creating/updating/removing Cinema Showtimes and creating/updating Movie Listings.

b. **Encapsulation**

The program only gives access to the private attributes through using public getter and setter methods. By managing external connections, we can ensure that private attributes are safe from any unauthorised modification. Encapsulation also provides and enhances security to user's private information.

c. Inheritance

Person class is a general class for person. Movie-goer class inherits from person. Therefore, movie-goer "is a" person.

d. Polymorphism

Our memberfunctions.java is an extension of MovieGoerFunctions.java. We used

```
public void BookTickets(String login) throws FileNotFoundException {
```

polymorphism by overloading some functions like Booktickets.

```
public void BookTickets(ArrayList<Movie> moviesAvailableForBooking) throws FileNotFoundException {
```

e. SOLID Design Principles

i. Single Responsibility

By using the MVC model, we ensured that each class created is tasked to do only 1 job. Classes under Model are **entity** classes, classes under Control are **controller** classes, and classes under View are **boundary** classes.
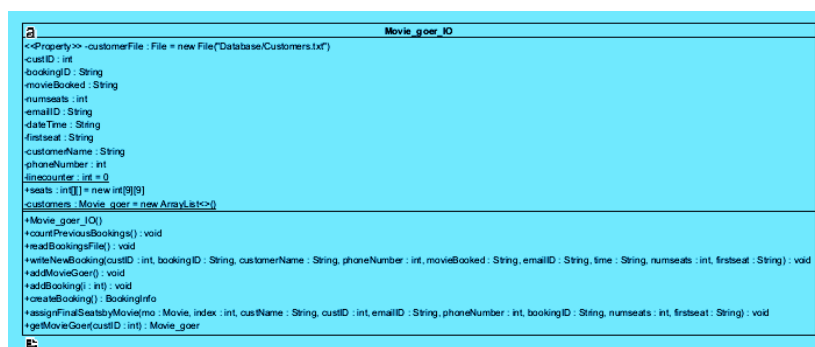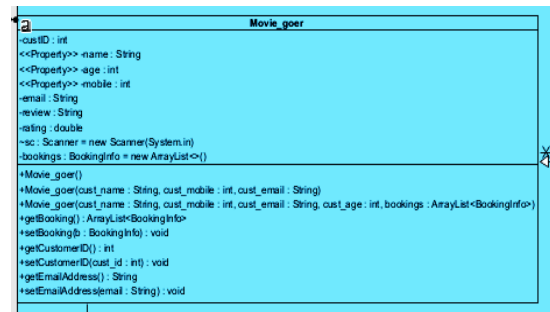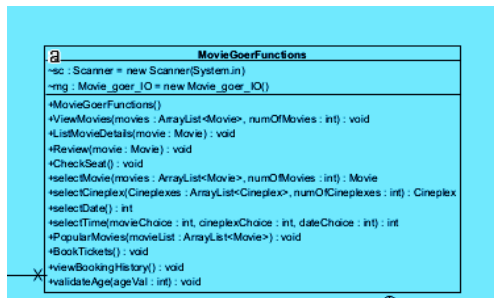
Movie-goer.java is an entity object that represents a movie-goer. MoviegoerFunctions.java is a class for what the entity object can do. Movie_goer_IO.java is to help the system read the text files. Doing this allows us to minimise dependency on other classes, so that any changes made to code will be made easier.

ii. Open/Closed

We have a Person class as an abstract class and Movie_goer extends Person. If we ever need to add any more classes that could be Person-related, we can always extend using Person. By doing this we can introduce new classes or functions to MOBLIMA without making any extensive changes to the main code.

iii. Interface Segregation

By using the MVC framework, we are able to easily implement this, by putting the interface classes in View. The classes here are in charge of displaying the necessary information specific to its function. For staff, we introduced 4 different interfaces: Configure Tickets, CreateUpdateRemoveCinemaShowtimes, CreateUpdateMovieListing and Configure Holidays.
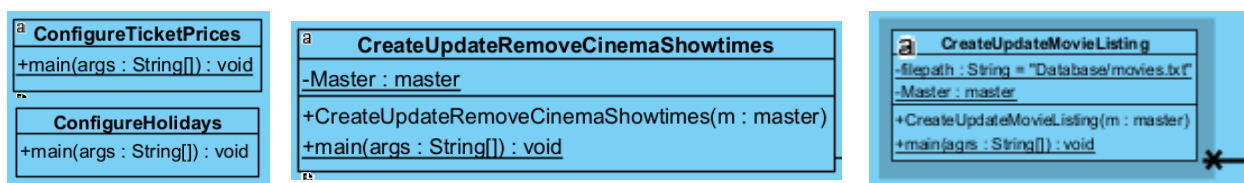
The 4 classes are meant for the admin to do the necessary settings configuration.

4. Features Suggested

Membership System

Since the current MOBLIMA app already has a login function for the users, we can make use of this function to introduce a rewards point system for users with membership, since we have a member login and a guest view. We can incentivize users to have an account and continue to use the MOBLIMA app. The reward system can be implemented by tracking the booking history (i.e. more bookings can lead to free tickets).

<u>Introduce Promotions (Seasonal)</u>

We can introduce seasonal promotions to the app. This can be easily implemented using ConfigureTicketPrices.java . Essentially, MOBLIMA would not be affected by any changes made and would still be able to work normally .

UML Class Diagram

Sample Test Cases

Test #1	Admin: Login + Create/Update/Remove Movie **Error Checking:** Ensures user selects options within the parameters
Input	**Output**
| 1<br>admin<br>password<br>1<br>1<br>Black Adam<br>Jaume Collet-Serra<br>Black Adam has gone from man to myth to legend. Now free, his unique form of justice, born out of rage, is challenged by modern-day heroes who form the Justice Society.<br>4 (Error checking)<br>1<br>1 (Error checking)<br>2<br>Dwayne Johnson<br>Sarah Shahi<br>1<br>2<br>7<br>2<br>1<br>3<br>7 | 1)<br><br>```
-------------------
Welcome to MOBLIMA!
1: Log in
2: Guest Session
3: Quit
Enter your choice: 1
Please enter username and password.
Username: admin
Password: password
```<br><br>2)<br><br>```
---------------------------
Welcome to the Admin Module!
1: Create/Update/Remove Movie Listing
2: Create/Update/Remove cinema showtimes
3: Configure Ticket Prices
4: Configure Holidays
5: Quit
Enter your choice: 1
1. Create a new Movie Listing
2. Update a Movie Listing
3. Remove a Movie Listing
4. Back

Please select an option
1
Enter Movie Title:
Black Adam
Enter Movie Director:
Jaume Collet-Serra
Enter Movie Synopsis:
Black Adam has gone from man to myth to legend. Now
Enter Movie Status:
1. COMING SOON
2. PREVIEW
3. NOW SHOWING

4
Invalid input, please try again!
Enter Movie Status:
1. COMING SOON
2. PREVIEW
3. NOW SHOWING

1
Enter the number of casts in the movie (Minimum 2)
1
Please enter at least 2 cast members!
Enter the number of casts in the movie (Minimum 2)
2
Enter Cast No. 1 Name:
Dwayne Johnson

Enter Cast No. 2 Name:
Sarah Shahi

Movie successfully added!
``` |

3)

```
Welcome to the Admin Module!
1: Create/Update/Remove Movie Listing
2: Create/Update/Remove cinema showtimes
3: Configure Ticket Prices
4: Configure Holidays
5: Quit
Enter your choice: 1
1. Create a new Movie Listing
2. Update a Movie Listing
3. Remove a Movie Listing
4. Back

Please select an option
2
1) Forest Gump
2) Crazy Rich Asians
3) The Godfather
4) Madagascar
5) Iron Man
6) Titanic
7) Black Adam
Please select a Movie Number: 7
Current Status of the Movie: COMING SOON
Enter Movie Status:
1. COMING SOON
2. PREVIEW
3. NOW SHOWING

2

Movie updated successfully!
```

4)

```
-------------------------
Welcome to the Admin Module!
1: Create/Update/Remove Movie Listing
2: Create/Update/Remove cinema showtimes
3: Configure Ticket Prices
4: Configure Holidays
5: Quit
Enter your choice: 1
1. Create a new Movie Listing
2. Update a Movie Listing
3. Remove a Movie Listing
4. Back

Please select an option
3
1) Forest Gump
2) Crazy Rich Asians
3) The Godfather
4) Madagascar
5) Iron Man
6) Titanic
7) Black Adam
Please select a Movie Number: 7

Movie successfully removed!
```

Test #2	Admin: Create/Update/Remove Cinema + show changes **Error Checking:** Ensures user selects a valid date
Input	**Output**
1 admin password 2 1 4 (Error checking) 1 4 (Error checking) 1 False 13/13/13 13:30 (Error checking) 20/12/22 22:30 7 2 1 7 2 3 2 3 1 7 1	 1) 2)

1)

```
-------------------------
Welcome to the Admin Module!
1: Create/Update/Remove Movie Listing
2: Create/Update/Remove cinema showtimes
3: Configure Ticket Prices
4: Configure Holidays
5: Quit
Enter your choice: 2

Please select an option:
1) Create show listing
2) Update show listing
3) Delete show listing
4) Back
1

1) Cathay Cineplexes Cineleisure Orchard
2) Shaw Theaters Nex
3) Golden Village Jurong Point

Select a Cineplex: 4
Invalid input, please try again!
1
Select a Screen (1 / 2 / 3): 4
Invalid input, please try again!
1
Is the Movie 3D? (true/false): false
Enter the Date Time (e.g. 13/12/11 12:30):  13/13/13 13:30
Invalid input, please try again!
20/12/22 22:30

-- All Movies --
1) Forest Gump
2) Crazy Rich Asians
3) The Godfather
4) Madagascar
5) Iron Man
6) Titanic
7) Black Adam

Please select a Movie to be added: 7
All changes have been successfully applied.
```

2)

```
All changes have been successfully applied.
Please select an option:
1) Create show listing
2) Update show listing
3) Delete show listing
4) Back
2

-- All Movies --
1) Forest Gump
2) Crazy Rich Asians
3) The Godfather
4) Madagascar
5) Iron Man
6) Titanic
7) Black Adam

Please make a selection:
 1) Select  to update show
 2) Back
1
Please select a Movie Index to list its details and shows: 7

Black Adam
Jaume Collet-Serra
Emotional movie!
5.0
PREVIEW
Black Adam has gone from man to myth to legend. Now free, his
Dwayne Johnson|Sarah Shahi|
```

3)
```
Show 1:
20/12/22 22:30
CineplexID: 1
CinemaID: 1
Movie Black Adam by Director Jaume Collet-Serra
Show Location: Cineplex ID: 1, Screen Number: 1
Show Time: 20/12/22 22:30


    1 2 3   4 5 6   7 8 9
A   ___    ___    ___
B   ___    ___    ___
C   ___    ___    ___
D   ___    ___    ___
E   ___    ___    ___
F   ___    ___    ___
G   ___    ___    ___
H   ___    ___    ___
I   ___    ___    ___

        Screen Here

     X  -  Occupied
     _  -  Vaccant
Please input the show number to be updated
1
Current show date and time:
20/12/22 22:30
Current Cineplex:
1
Current Cinema:
1

Please make a selection:
 1) Update Show Date and Time
 2) Update Cineplex
 3) Update Cinema
 4) Back
2
1) Cathay Cineplexes Cineleisure Orchard
2) Shaw Theaters Nex
3) Golden Village Jurong Point

Select a Cineplex: Enter updated cineplex number:
3
Show 1 updated!
```

4)
```
-- All Movies --
1) Forest Gump
2) Crazy Rich Asians
3) The Godfather
4) Madagascar
5) Iron Man
6) Titanic
7) Black Adam

Please make a selection:
 1) Select  to delete show
 2) Back
1
Please select a Movie Index to list its details and shows: 7

Black Adam
Jaume Collet-Serra
Emotional movie!
5.0
PREVIEW
Black Adam has gone from man to myth to legend. Now free, his
Dwayne Johnson|Sarah Shahi|


Show 1:
29/29/19 22:32
CineplexID: 3
CinemaID: 3
Movie Black Adam by Director Jaume Collet-Serra
Show Location: Cineplex ID: 3, Screen Number: 3
Show Time: 29/29/19 22:32


    1 2 3   4 5 6   7 8 9
A   ___    ___    ___
B   ___    ___    ___
C   ___    ___    ___
D   ___    ___    ___
E   ___    ___    ___
F   ___    ___    ___
G   ___    ___    ___
H   ___    ___    ___
I   ___    ___    ___

        Screen Here

     X  -  Occupied
     _  -  Vaccant
Please input the show number to be removed
1
```

Test #3	Admin: Configure holiday prices + show changes
Input	**Output**
1 admin password 3 8 3.0 10 11 5	<pre>-- Configure Ticket Prices --

1. 3D Movie Surcharge
2. Seat Type - Standard
3. Seat Type - Premium
4. Seat Type - Platinum
5. Child Discount
6. Senior Citizen Discount
7. Student Discount
8. Public Holiday Surcharge
9. GST %
10. IMPLEMENT ALL CHANGES
11. Back

Select an option: 8
Current Surcharge: 2.0
Enter New Surcharge: 3.0</pre>
<pre>1. 3D Movie Surcharge
2. Seat Type - Standard
3. Seat Type - Premium
4. Seat Type - Platinum
5. Child Discount
6. Senior Citizen Discount
7. Student Discount
8. Public Holiday Surcharge
9. GST %
10. IMPLEMENT ALL CHANGES
11. Back

Select an option: 10
All changes have been successfully applied.</pre> |

Test #4	Movie-goer: Search Movie + book and purchase movie + show booking
Input	**Output**
1 kx o 1 1 3 3 2 1 1 1 A1 Y 2 2 2 6	*(see screenshots below)*

1)
```
Welcome to MOBLIMA!
1: Log in
2: Guest Session
3: Quit
Enter your choice: 1
Please enter username and password.
Username: kx
Password: o
---------------------
Welcome to MovieGoer Module!
1. Search / list movies and view movie details
2. Check seat availability and selection of seat/s
3. Book and purchase tickets
4. View your booking history
5. List the top 5 movies ranked by ticket sales OR by overall reviewers? ratings
6. Quit
Enter your choice: 1
Select a movie below:
--- Movie Listing ---
1. Forest Gump
2. Crazy Rich Asians
3. The Godfather
4. Madagascar
5. Iron Man
6. Titanic
1
```

2)
```
--- Movie Listing ---
1. Forest Gump
null
Showing Status: NOW SHOWING
Movie Synopsis:
A story following a man with low IQ
Review(s) of the movie:
Great american classic!
Movie Rating(s):
3.0
4.0

------------------------
--- Shows available for this movie ---
Show 1
Showtimes:
01/01/23 12:30
Cineplex: 1
Theatre: 1

------------------------
Would you like to:
1. Review this movie?
2. Rate this movie?
3. Skip for now.
```

3)
```
Welcome to MovieGoer Module!
1. Search / list movies and view movie details
2. Check seat availability and selection of seat/s
3. Book and purchase tickets
4. View your booking history
5. List the top 5 movies ranked by ticket sales OR by overall reviewers? ratings
6. Quit
Enter your choice: 3
--- Ticket Booking & Purchase ---
Select a movie below:
--- Movie Listing ---
1. Forest Gump
2. Crazy Rich Asians
3. The Godfather
4. Madagascar
5. Iron Man
6. Titanic
2
Crazy Rich Asians
```

4)
```
Select Cineplex:
--- Cineplex Listing ---
1. Cathay Cineplexes Cineleisure Orchard
2. Shaw Theaters Nex
3. Golden Village Jurong Point
1
Cathay Cineplexes Cineleisure Orchard
15/12/11
test
Passed in: 15/12/11 13:30
Converted to: 15/1

Show 1:
Date & Time:
15/12/11 13:30
Cineplex ID: 2
Cinema ID: 2
Cinema Class: Premium
3D Movie? false
Ticket Price: S$12.084 (Inclusive of GST)
--------------------------------------------------
13/11/11
test
Passed in: 13/11/11 9:30
Converted to: 13/1

Show 2:
Date & Time:
13/11/11 9:30
Cineplex ID: 1
Cinema ID: 1
Cinema Class: Standard
3D Movie? false
Ticket Price: S$7.049 (Inclusive of GST)
--------------------------------------------------
Enter show index:
```

5)
```
1
Movie Crazy Rich Asians by Director Jon M. Chu
Show Location: Cineplex ID: 2, Screen Number: 2
Show Time: 15/12/11 13:30


    1 2 3   4 5 6   7 8 9
A   _ _ _   _ _ _   _ _ _
B   _ _ _   _ _ _   _ _ _
C   _ _ _   _ _ _   _ _ _
D   _ _ _   _ _ _   _ _ _
E   _ _ _   _ _ _   _ _ _
F   _ _ _   _ _ _   _ _ _
G   _ _ _   _ _ _   _ _ _
H   _ _ _   _ _ _   _ _ _
I   _ _ _   _ _ _   _ _ _

        Screen Here

    X - Occupied
      - Vaccant
Enter the total number of seats:
1
Enter the first seat (ie. A1: Row 1 Seat 1; B2: Row 2 Seat 2):
A1
Confirm booking? Y/N
Y
false
Booking ID: CCO202210132136
Movie tickets successfully booked!
```

6)
```
Welcome to MovieGoer Module!
1. Search / List movies and view movie details
2. Check seat availability and selection of seat/s
3. Book and purchase tickets
4. View your booking history
5. List the top 5 movies ranked by ticket sales OR by overall reviewers? ratings
6. Quit
Enter your choice: 2
--- Seat Availability ---
Select Cineplex:
--- Cineplex Listing ---
1. Cathay Cineplexes Cineleisure Orchard
2. Shaw Theaters Nex
3. Golden Village Jurong Point
2
Shaw Theaters Nex
Select theatre - 1, 2 or 3:
2
```

7)
```
--- All available movies at selected theatre ---
Movie Crazy Rich Asians by Director Jon M. Chu
Show Location: Cineplex ID: 2, Screen Number: 2
Show Time: 15/12/11 13:30


    1 2 3   4 5 6   7 8 9
A   X _ _   _ _ _   _ _ _
B   _ _ _   _ _ _   _ _ _
C   _ _ _   _ _ _   _ _ _
D   _ _ _   _ _ _   _ _ _
E   _ _ _   _ _ _   _ _ _
F   _ _ _   _ _ _   _ _ _
G   _ _ _   _ _ _   _ _ _
H   _ _ _   _ _ _   _ _ _
I   _ _ _   _ _ _   _ _ _

        Screen Here

    X - Occupied
      - Vaccant
--------------------------
```

Test #5	Movie-goer: Search Movie + book and purchase movie + show booking (holiday)
	Error Checking: Prevents users from accidentally cancelling their bookings.

Input	Output
1 kx o 1 5 3 3 1 2 1 1 A1 N **(Error Checking)** N **(Error checking)** Y 2 2 2 6	1) 2) 3) 4) 5) 6)

Test #6	Admin: Delete Show Listing
	Error Checking: Ensures the admin selects the correct option.

Input	Output
1 admin password 2 **5 (Error checking)** 3 1 2 **3 (Error checking)** 2 3 1 2 2 4 5 3	

1)
```
---------------------------
Welcome to MOBLIMA!
1: Log in
2: Guest Session
3: Quit
Enter your choice: 1
Please enter username and password.
Username: admin
Password: password
---------------------------
Welcome to the Admin Module!
1: Create/Update/Remove Movie Listing
2: Create/Update/Remove cinema showtimes
3: Configure Ticket Prices
4: Configure Holidays
5: Quit
Enter your choice: 2
```

2)
```
Please select an option:
1) Create show listing
2) Update show listing
3) Delete show listing
4) Back
5

Please select an option:
1) Create show listing
2) Update show listing
3) Delete show listing
4) Back
3
```

3)
```
-- All Movies --
1) Forest Gump
2) Crazy Rich Asians
3) The Godfather
4) Madagascar
5) Iron Man
6) Titanic

Please make a selection:
 1) Select to delete show
 2) Back
1
Please select a Movie Index to list its details and shows: 2
```

4)
```
Crazy Rich Asians
Jon M. Chu
Best movie ever! Must watch!
4.500000 3.700000 5.000000
NOW SHOWING
Rachel, a professor, dates a man named Nick and looks forward to meeting his family. However,
she is shaken up when she learns that Nick belongs to one of the richest families in the count
ry.
Constance Wu|Henry Golding|

Show 1:
15/12/11 13:30
CineplexID: 2
CinemaID: 2
Movie Crazy Rich Asians by Director Jon M. Chu
Show Location: Cineplex ID: 2, Screen Number: 2
Show Time: 15/12/11 13:30

    1 2 3  4 5 6  7 8 9
A   X __   ___   ___
B   ___   ___   ___
C   ___   ___   ___
D   ___   ___   ___
E   ___   ___   ___
F   ___   ___   ___
G   ___   ___   ___
H   ___   ___   ___
I   ___   ___   ___

       Screen Here

       X - Occupied
       _ - Vaccant
```

5)
```
Show 2:
13/11/11 9:30
CineplexID: 1
CinemaID: 1
Movie Crazy Rich Asians by Director Jon M. Chu
Show Location: Cineplex ID: 1, Screen Number: 1
Show Time: 13/11/11 9:30

    1 2 3  4 5 6  7 8 9
A   ___   ___   ___
B   ___   ___   ___
C   ___   ___   ___
D   ___   ___   ___
E   ___   ___   ___
F   ___   ___   ___
G   ___   ___   ___
H   ___   ___   ___
I   ___   ___   ___

       Screen Here

       X - Occupied
       _ - Vaccant
Please input the show number to be removed
3
Invalid input!
```

6)
```
---------------------------
Welcome to the Admin Module!
1: Create/Update/Remove Movie Listing
2: Create/Update/Remove cinema showtimes
3: Configure Ticket Prices
4: Configure Holidays
5: Quit
Enter your choice: 2

Please select an option:
1) Create show listing
2) Update show listing
3) Delete show listing
4) Back
3
```

7)
```
-- All Movies --
1) Forest Gump
2) Crazy Rich Asians
3) The Godfather
4) Madagascar
5) Iron Man
6) Titanic

Please make a selection:
 1) Select to delete show
 2) Back
1
Please select a Movie Index to list its details and shows: 2
```

8)
```
Crazy Rich Asians
Jon M. Chu
Best movie ever! Must watch!
4.500000 3.700000 5.000000
NOW SHOWING
Rachel, a professor, dates a man named Nick and looks forward to meeting his family. However,
she is shaken up when she learns that Nick belongs to one of the richest families in the count
ry.
Constance Wu|Henry Golding|

Show 1:
15/12/11 13:30
CineplexID: 2
CinemaID: 2
Movie Crazy Rich Asians by Director Jon M. Chu
Show Location: Cineplex ID: 2, Screen Number: 2
Show Time: 15/12/11 13:30

    1 2 3  4 5 6  7 8 9
A   X __   ___   ___
B   ___   ___   ___
C   ___   ___   ___
D   ___   ___   ___
E   ___   ___   ___
F   ___   ___   ___
G   ___   ___   ___
H   ___   ___   ___
I   ___   ___   ___

       Screen Here

       X - Occupied
       _ - Vaccant
```

9)
```
Show 2:
13/11/11 9:30
CineplexID: 1
CinemaID: 1
Movie Crazy Rich Asians by Director Jon M. Chu
Show Location: Cineplex ID: 1, Screen Number: 1
Show Time: 13/11/11 9:30

    1 2 3  4 5 6  7 8 9
A   ___   ___   ___
B   ___   ___   ___
C   ___   ___   ___
D   ___   ___   ___
E   ___   ___   ___
F   ___   ___   ___
G   ___   ___   ___
H   ___   ___   ___
I   ___   ___   ___

       Screen Here

       X - Occupied
       _ - Vaccant
Please input the show number to be removed
2
```

10)
```
Please select an option:
1) Create show listing
2) Update show listing
3) Delete show listing
4) Back
4

---------------------------
Welcome to the Admin Module!
1: Create/Update/Remove Movie Listing
2: Create/Update/Remove cinema showtimes
3: Configure Ticket Prices
4: Configure Holidays
5: Quit
Enter your choice: 5
Returning to main screen...
---------------------------
Welcome to MOBLIMA!
1: Log in
2: Guest Session
3: Quit
Enter your choice: 3
Thank you for using MOBLIMA!
```