

PROGRAMMING ASSIGNMENT 4

Issue Date : 22.04.2022 - Friday

Recitation Date : 22.04.2022 - Friday (14:00) (will be held on Zoom)

Due Date : 13.05.2022 - Friday (23:59:59)

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HUCS Cinema Reservation System



1 Introduction

In this assignment, you are expected to gain practice on developing a Graphical User Interface (GUI) application using Java programming language. As opposed to the command-line programs where the interaction between the user and the computer often relies on a string of text, a GUI program offers a much richer type of interface where the user uses a mouse and keyboard to interact with GUI components such as windows, menus, buttons, checkboxes, text input boxes, scroll bars, and so on. Because most people today interact with their computers exclusively through GUI, developing a GUI based application has become a must for the new developers.

There are many frameworks to develop a GUI application (such as Swing, SWT, AWT, and the like). In this assignment, you are to employ JavaFX framework to complete this assignment. JavaFX is a software platform for creating and delivering desktop applications and Rich Internet Applications (RIAs) that can run across a wide variety of devices. JavaFX supports desktop computers and web browsers on Microsoft Windows, Linux, and macOS.

In this assignment, a very simplified version of the Cinema Reservation System is expected from you to develop through JavaFX framework. All details you need while designing the system are explained in the following section; also, a demo video will be provided for you.

2 System Requirements

- The system must read “backup.dat” to initialize the database (e.g. Collections). Note that it must start with an empty database (just containing an admin that is club member namely “admin” with a password of “password”) for initialization if there is no “backup.dat” file.

```

user kaixxa QoJG1HhHVmxTQy3g6zjsv== false true
user robert ifw3E2CztQeo6+KLvc1Zlg== false false
user abc AlHue1MB1z/x7t17KkOP6Q== true false
user admin X03MO1qn2dYdgyfeILPmQ== true true
user jane S1M7yVwMc1kb29/k3VqRGQ== false false
film Avengers: Endgame avengers_endgame.mp4 182
film Doctor Strange in the Multiverse of Madness doctor_strange_in_the_multiverse
film Fantastic Beasts: The Secrets of Dumbledore fantastic_beasts_the_secrets_of_
film The Imitation Game the_imitation_game.mp4 114
film The Batman the_batman.mp4 176
film Sonic the Hedgehog 2 sonic_the_hedgehog_2.mp4 122
hall Fantastic Beasts: The Secrets of Dumbledore S3 65 7 6
hall The Imitation Game CS Hall 45 6 8
hall The Batman S5 80 6 8
hall Sonic the Hedgehog 2 Child Hall 45 6 7
hall The Imitation Game Alan Turing Hall 30 10 10
hall Avengers: Endgame S1 70 10 8
hall Doctor Strange in the Multiverse of Madness S2 60 8 9
seat Fantastic Beasts: The Secrets of Dumbledore S3 0 0 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 0 1 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 0 2 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 0 3 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 0 4 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 0 5 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 1 0 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 1 1 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 1 2 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 1 3 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 1 4 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 1 5 null
seat Fantastic Beasts: The Secrets of Dumbledore S3 2 0 null

```

Figure 1: backup.dat

- Note that you are not responsible for any erroneous line, but you should skip empty lines even if they contain whitespace characters such as a newline character, a space character, tab character, etc.
- A sample backup file is provided for you, the structure of it as follows:

* For user record:

· user[tab]username[tab]hashed_password_in_base64_format[tab>true_if
_club_member_false_if_vice versa[tab>true_if_admin_false_if_vice versa

* For film record:

· film[tab]filmname[tab]trailer_path(relative)[tab]duration

* For hall record:

· hall[tab]filmname[tab]hallname[tab]price_per_seat[tab]row[tab]column

* For seat record:

· seat[tab]filmname[tab]hallname[tab]row_of_seat[tab]column_of_seat[tab]
owner_name(null_if_not_owned)[tab]price_that_it_has_been_bought
(can_be_any_number_if_seat_is_not_bought_yet)

- Note that the user, film, hall and seat records can be provided in any line of the backup, but it is guaranteed that all the seats of a hall are provided after that hall's record, all the halls of a film are provided after that film's record, all the seats of a user are provided after that user's record.

- The system must save the current state to “backup.dat” if the user clicks the exit button (the native exit button of operating system, cross button at the top right for Windows OS, at the top left for MacOS, Linux, etc.).
 - Note that your system must reinitialize itself by that backup at next runs.
- The window’s header must be named as same as property namely “title” at properties file, and the logo must be the icon at the “.../assets/icons/logo.png”. You can read “properties.dat” by native reader of Properties class of Java.
- The system must check credentials of user at the login window.

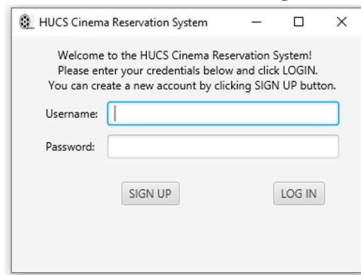


Figure 2: Login Window

- The system must give appropriate error sound (“.../assets/effects/error.mp3”) and message, if there is an issue (such as no such a credential).
- The system must check if passwords are matching at signup window.

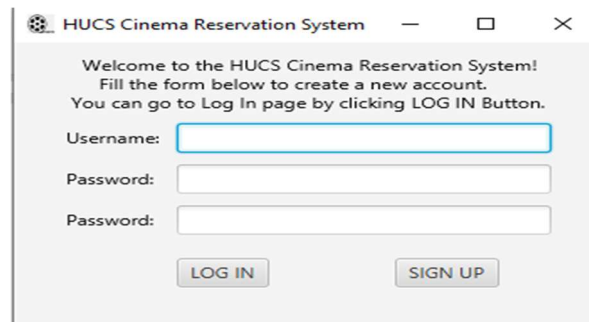


Figure 3: Signup Window

- The system must give appropriate error sound (“.../assets/effects/error.mp3”) and message if they are not matching.
- The system must check if username already exists at signup window.
 - The system must give appropriate error sound (“.../assets/effects/error.mp3”) and message if they are not matching.
- The newly created users must be non-admin and non-club-member.

- The system must open welcome window after login.
 - If logged in user is a normal user, then system must show following:
 - * A text that welcomes user with showing his/her nickname and stating that club member (if he/she is)
 - * A dropdown list that contains available films. Note that one of the options must be selected as default.
 - * OK button for confirming selection.
 - * Log Out button that logs out user from system and directs to login window.
 - If logged in user is an admin, then system must show following in addition to normal user:
 - * Welcome text must also state that user is admin.
 - * Buttons for adding/removing film, editing users.
- The system must open film window after selecting and confirming selection.

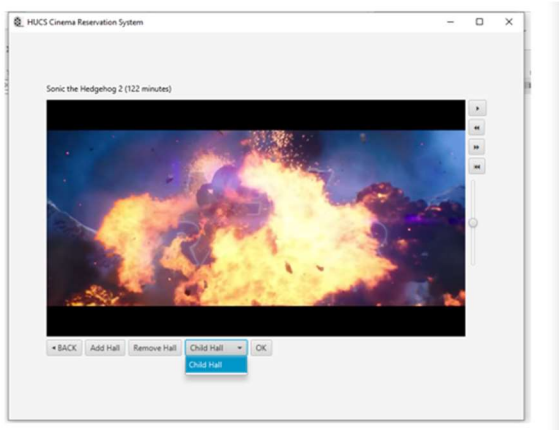


Figure 4: Film Window (Admin)

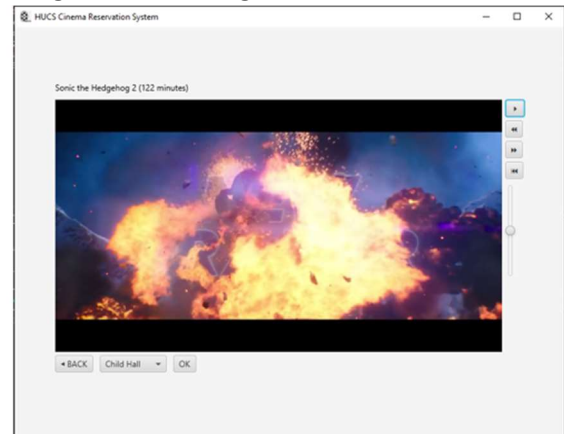


Figure 5: Film Window (Normal User)

- If current user is a normal user, the film window should show followings:
 - * Name of the film and duration of the film.
 - * Media buttons (play/pause, skip back for 5 seconds, skip forward for 5 seconds, rewind button, volume slider). Note that system should not skip back more than beginning of the trailer and should not skip forward more than ending of the trailer, in short, your system should not crash if user tries to skip forward for five seconds even if there is less than five seconds to end of the trailer.
 - * Back button that directs previous window.
 - * A dropdown list that contains available halls. Note that one of the options should be selected as default.

- * OK button for confirming selection.
- If current user is an admin, the film window should show following in addition to normal user:
 - *Add Hall and Remove Hall buttons.
- The system must open hall window after selecting and confirming the hall, note that fragment must be stopped in case of changing screen (back or OK buttons).

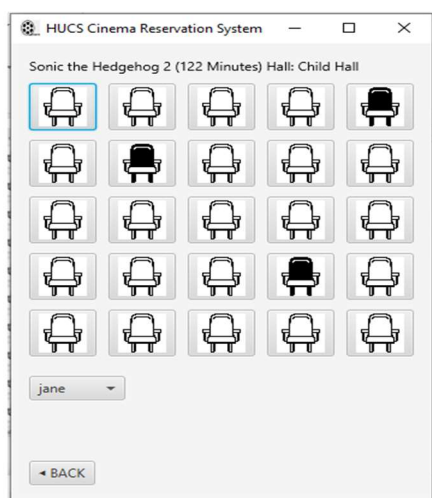


Figure 6: Hall Window (Admin)

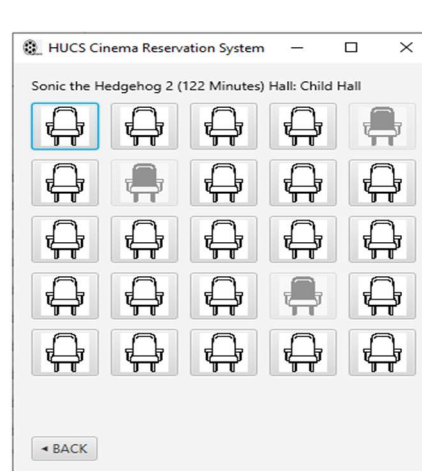

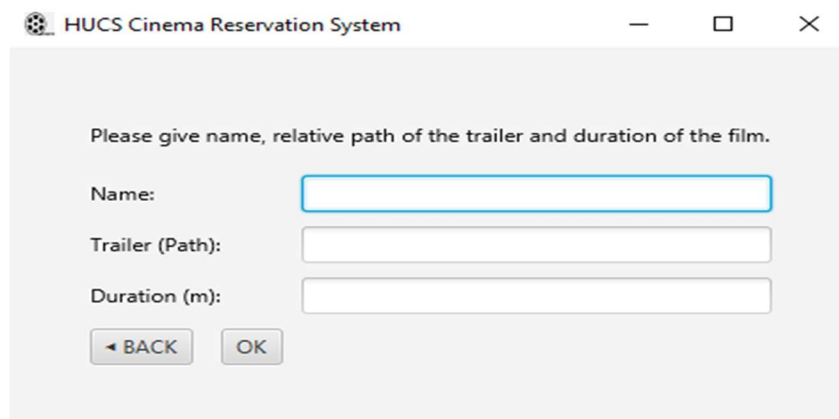


Figure 7: Hall Window (Normal User)

- If current user is a normal user, the hall window should show following:
 - *A text that tells the name of the movie and hall name.
 - * Available seats as selectable buttons with appropriate image (empty_seat.png) 
 - Bought seats
 - As selectable buttons with an appropriate image (reserved_seat.png) if those seats are reserved by current user.
 - As not selectable buttons with an appropriate image (reserved_seat.png) if vice versa.
 - * The seats must be in air view and the order that curtain is at bottom.
 - * User can buy empty seats or get refund for reserved seats simply by clicking on them, system show a message about the operation, containing seat number (in a-b format, where a is the row number and b is the column number – one indexed, indexing begins from one)
 - * Back button that directs to previous window.

- If current user is an admin, the hall window should show following in addition to normal user:
 - * All seats are as selectable buttons as admin can easily refund any reserved seat just by simply clicking on them.
 - * A dropdown list containing the users' name, admin can select the name of the user and then the seat so that he/she can reserve a seat for that user. Note that one of the options should be selected as default.
 - * A message about the seat that only appears if mouse is over that seat.
- The system must open add film window after clicking on it. This window is just for admins and contains following:



The screenshot shows a window titled "HUCS Cinema Reservation System" with standard window controls (minimize, maximize, close). Inside the window, there is a text prompt: "Please give name, relative path of the trailer and duration of the film." Below this prompt are three input fields: "Name:", "Trailer (Path):", and "Duration (m):". At the bottom of the form are two buttons: "◀ BACK" and "OK".

Figure 8: Add Film Window

- A message that tells what is going on (such as "Please give name, relative path of the trailer and duration of the film.") – Field for name of the film.
 - * System should check if name of the film is unique and not empty, if not then must give appropriate error message and error sound (".../assets/effects/error.mp3").
- Field for relative path of trailer (Relative to ".../assets/trailers/" path)
 - * System should check if there is such a file, if not then should give appropriate error message and error sound (".../assets/effects/error.mp3").
- Field for duration of film in minutes.
 - * System should check if given data is positive integer, if not then should give appropriate error message and error sound (".../assets/effects/error.mp3").
- Back button that directs to previous window.
- OK button for confirming input.

The system must open remove film window after clicking on it. This window is just for admins and contains following:

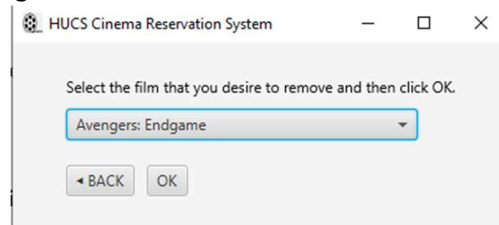


Figure 9: Remove Film Window

- A message that tells what is going on (such as “Select the film that you desire to remove and then click OK.”)
- A dropdown list that contains films. Note that one of the options should be selected as default.
- Back button that directs to previous window.
- OK button for confirming delete.
- * System must refresh the list after deleting.
- * System must delete corresponding halls and seats that belongs to that movie.
- The system must open edit users window after clicking on it. This window is just for admins and contains following:

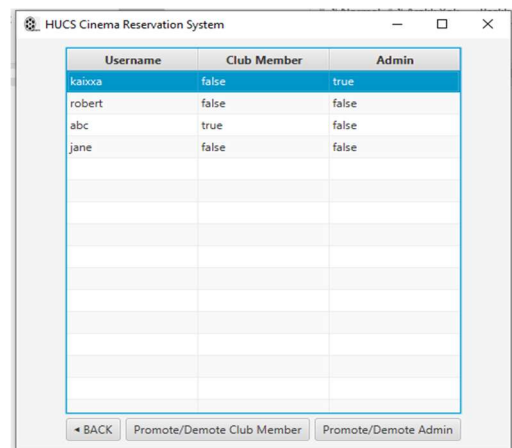


Figure 10: Edit Users Window

- A table that has three columns namely username, club member, admin. Note that one of the options should be selected as default. The system should show the following message on table if there is no user at database: “No user available in the database!”
- Back button that directs to previous window.

- Promote/Demote Club Member button that promotes or demotes selected user (promotes if he/she is not, demotes if he/she is)
- Promote/Demote Admin button that promotes or demotes selected user (promotes if he/she is not, demotes if he/she is)
- Note that the current user must not be in the table!
- The system must open add hall window after clicking on it. This window is just for admins and contains following:

The screenshot shows a window titled "HUCS Cinema Reservat...". Inside, the text "Sonic the Hedgehog 2 (122minutes)" is displayed. Below it are two dropdown menus: "Row:" with the value "4" and "Column:" with the value "5". There are two text input fields labeled "Name:" and "Price:". Below these are two buttons: "BACK" and "OK". At the bottom, an error message reads "ERROR: This hall already exists!".

Figure 11: Add Hall Window

- A text that contains name and duration of the film.
- Two dropdown lists that is for selecting row and column count of the hall (from three to ten in number format, such as 3, not three) Note that the option three must be selected as default.
- Name of the hall.
 - * Name of the hall must be unique (not only for current film but also for all films) and cannot be empty, if not then should give appropriate error message and error sound (".../assets/effects/error.mp3").
- Price for single ticket.
 - * Price must be discounted for club users with discount rate as stated at properties file. Note that price should be discounted if and only if the user is a club member when buying a ticket.
 - * System must check if given data is positive integer, if not then should give appropriate error message and error sound (".../assets/effects/error.mp3").

The system must remove the selected hall after clicking on Remove Hall Button.

- * System should refresh the list after deleting.