Escape Room Game Design Document

Version 1.0 – 2023.11.05

Created 2023.10.22

Project

Taha H
Angela L
Farah H
Fauzan K

GitLab Repository:

https://mcsscm.utm.utoronto.ca/csc207_20239/group_42

SECTION 1: PROJECT IDENTIFICATION

To ensure our escape room project is inclusive for all, we're motivated to provide an immersive and engaging game experience that fosters problem-solving and critical thinking skills. Our innovative approach, which includes unique themes, intricate puzzles, and storytelling will not only enhance the traditional escape room concept but also make it more captivating, elevating the overall enjoyment and excitement of the experience. Accessibility for people with disabilities is integral to our commitment.

SECTION 2: USER STORIES

Key: Addition: Green
Removal: Red
Combine: Yellow

Name	Id	Owner	Description	Implementation Details	Priority	Effort
SaveView	1	Angela	As a user, I want to be able to save games so that I have the option to go back to the specific game state at any time.	Creating a Save-View Class allows the user to save the current state of the game to a binary file. The save view will contain a button labeled "save" for the user to save the game, a button "cancel" for the user to exit the save view, and a text field that displays "save successfully" if the file is saved.	1	3
LoadView	2	Angela	As a user, I want to be able to load the game so that I can return to a specific game state that I want.	Create a Load-View Class and allow users to load the game by converting a binary file into a game object. The load view will contain a button labeled "load" for the user to load the game, a button "cancel" for the user to exit the load view, and a text field that displays "load successfully" if the game successfully loaded in.	1	3

~~Display Possible Places~~	~~3~~	~~Angela~~	~~As a user, I want to be able to see the possible places where the clues could be so that I can navigate the room and find the clues.~~	~~Create a text object in the escapeGameView that displays all of the possible places in the room.~~	~~2~~	~~1~~
Room Images + Descriptive Text (Merge user story 4 and 5)	4	Angela	As a deaf player, I should be able to see the images and description of the room so that I will know which room I am in.	Create a text object and an attribute associated with every image object that includes captions and use the Java accessibility library. Find images that are related to the room. Write a room description that is related to the room.	1	2
Room Description Audio	6	Angela	As a non-sighted player, I should be able to hear all of the information about the room so that I will be able to play the game.	Create media and media player objects that play the audio every time the player goes to the room or transitions to a new room.	1	3
Keyboard	7	Fauzan	As a user, I should be able to enter commands into the textbox to be able to go through different rooms and use all available commands	When a user is prompted to enter a response on the textbook, they should press ENTER or TAB. The user's response should be registered and processed using the enter and tab keys. Then, it navigates to other rooms or executes the command.		
Play MiniGame	8	Fauzan	As a user, I want to play the puzzles available in each room so that I am able to access the clues of the room.	Each room will have its own mini-games. Create an object of that minigame. After the minigame is won, the clue should go to the user's inventory and move to the next question in the room. If a minigame is lost, then it should simply move to the next question and keep the clue in that room.	1	2

~~Attempts~~	~~9~~	~~Fauzan~~	~~As a user, I should be able to see how many attempts remain that I have left before I lose.~~	~~Create an attribute that tracks the user's attempts and once it reaches max attempts, the user loses. Display/print the # of attempts remaining for the user to see.~~	1	1
Clues	10	Fauzan	As a user, I should be able to look at objects/clues in the room which can help me formulate a password so that I can move forward by going to the next room	~~If zoom is clicked, then the object/clue is zoomed in to assist the user.~~ If the clue object pane is clicked, the images and text description of the clue object will be shown in the main game view to guide the user and hint him to move forward.	1	2
~~Knowledge~~	~~11~~	~~Fauzan~~	~~As a user, I want to be able to understand what the game is asking me to do so that I can move forward through the game.~~	~~After every move or command is passed, it will display new images and text that will tell the user what the goal is next and where they currently are.~~	~~2~~	~~2~~
~~Inventory~~	~~12~~	~~Farah~~	~~As a user, I want to see all the clues in my inventory so that I can guess the password to get to the next room at any time.~~	~~Create a button called "Inventory" that when it is clicked will look at the Player class and then at the inventory attribute and then it will display the elements of the inventory attribute as a list format. The inventory attribute is a list that contains the clues (stings) that the player has collected. Create an inventory view and display all the views, add a scroll pane.~~	~~2~~	~~1~~
Inventory Audio	13	Farah	As a non-sighted user, I want to hear the description of the clues in my inventory so that I can put the clues together to guess a password.	Create a button object that looks at the inventory and plays an audio of each of the clues in the inventory. Create a map from clues to audio so that we can find the audio depending on the inventory of the user.	1	2
Exit Button	14	Farah	As a user, I want to be able to find a button so that I can end the game at any	Create a button object that exits the program when it is clicked.	4	1

			time (emergency exit).			
Restart Button	15	Farah	As a user, I want to be able to find a button so that I can restart the game	Create an object that erases the user´s progress and data and places the user in the starting point of the game.	4	2
Instructions	16	Taha	As a user, I want to be able to see the instructions of the game so that I can understand what to do to progress to the next room	Create a button labeled "Instructions". Check if the button is clicked through the <addInstructionEvent> method, and if so, call the <showInstructions> method to display instructions.	2	3
Time	17	Taha	As a user, I want to be able to see the remaining time left to escape all 4 rooms so that I can manage my time and avoid losing the game.	Create a Timer object to store the time remaining. Create a Vbox object to store how the time will be displayed. Use a JavaFX Timeline with a one-second KeyFrame to update the timer label, and decrement the timer count.	3	2
Audio Time	18	Taha	As a non-sighted user, I want to be able to listen to a warning every 10 minutes reminding me how much time I have left to escape so that I can manage my time and avoid losing the game.	Create a MediaPlayer object using the playAudioTime method to play an audio file announcing the remaining time. The sound file is stored in the "EscapeRooms/<EscapeRoomName> /sounds" directory, and a Media object is instantiated within the method to pass the file directory of the sound.	2	2
Hint	19	Taha	As a non-sighted screen reader user, I want to be able to hear a hint if I am stuck guessing the password so that I can move on to the next room.	Create a button labeled "Hint" that the user can click on to display the hint through text. Create the button in the <initUI> method and a <displayHint> method that display the hint using an alert UI element.	3	1

Audio Hint	20	Taha	As a blind user, I want to be able to listen to a hint if I am stuck guessing the password so that I can move on to the next room.	Create a button labeled “Hint” that the user can click on to play the audio of the hint. Store the sound file of the audio for the hint in the “EscapeRooms/<EscapeRoomName> /sounds” directory. Create a Media object that passes the file directory of the sound. Use the MediaPlayer .play() method.	4	1
~~Change Background Color~~	~~21~~	~~Angela~~	~~As a player, I want to be able to change the background color to either black and white of the game view based on my preferences.~~	~~Create two buttons labeled “white” or “black” on the top corner right of the game View.~~	~~4~~	
Save-Folder	22	Angela + Fauzan	As a user, I want to be able to see the images and hear the description of the room and the room object so that I know which room that I am in.	Create folders labeled objectImages, room-images, and sounds in the directory path Games/TinyEscapeRoomGame that stores all of the audios, room-images, and objectImages.	1	2
Guess Password	23	Taha	As a user, I want to be able to guess the password for the current room so that I can continue escaping all of the rooms to win the game.	Inside the < interpret action> method in the<AdventureGameController> class, check if the user enters the password command. If it is an empty password display a warning, otherwise, compare the entry with the room password and move the player to the next room	1	2
Display Victory	24	Taha	As a user, I want to be able to be notified when I have won the game so that I can celebrate and conclude the experience on a high note.	Inside the < interpret action> method in the<AdventureGameController> class, check if the player's current room is the last room when they guess the room's password, if so, call the <movePlayer> method to the winning room.	2	2

View MiniGame Clue Answer	25	Taha	As a user, I want to be able to review the answers to the mini-game clues so that I can correctly guess the password for the current room.	Inside the < interpret action> method in the<AdventureGameController> class, check if the player enters the view command. If the clue is in the player's inventory, display the answer text from the <getAnswer> method.	1	3

Acceptance Criteria

Name	ID	Description
Save View	1	Given I am a player, When I navigate the save view, I will see the name of the file that I want to save and two buttons labeled “save” and “canceled”. I click the “save” button. Then, I see the text on the save view displaying “saved successfully” " and, I can click the “cancel” button to exit the save view.
Load View	2	Given I am a player, When I navigate to the load view, I will see the list of binary files (games) that I saved and two buttons labeled “load” and “canceled”. I select a specific game and then click on the “load” button. Then, I see the text on the load view displaying “load successful”, And, I can click the “cancel” button to exit the load view.
~~Display Possible Places~~	~~3~~	~~Given I am a player,~~ ~~When I prompt the game to list all of the possible places of the clues,~~ ~~Then, I see the text at the center of the gameView changed,~~ ~~And, I see the text displaying all of the possible places of the clues.~~
Descriptive Room Images + Description	4	Given I am a deaf player, And I enter the game screen, When I go into an escape room, Then, I see the images and description that show the current room that I am in.
Room Description Audio	6	Given I am a non-sighted player, And I enter the game screen, When I go into an escape room, Then, I hear the audio describing the current escape room that I am in, And I hear the instructions and hints of the game in this room
Keyboard	7	Given I am a player, When I am prompted to press ENTER or TAB, the game registers my keys and does the action required. Then, I navigate/go to other rooms

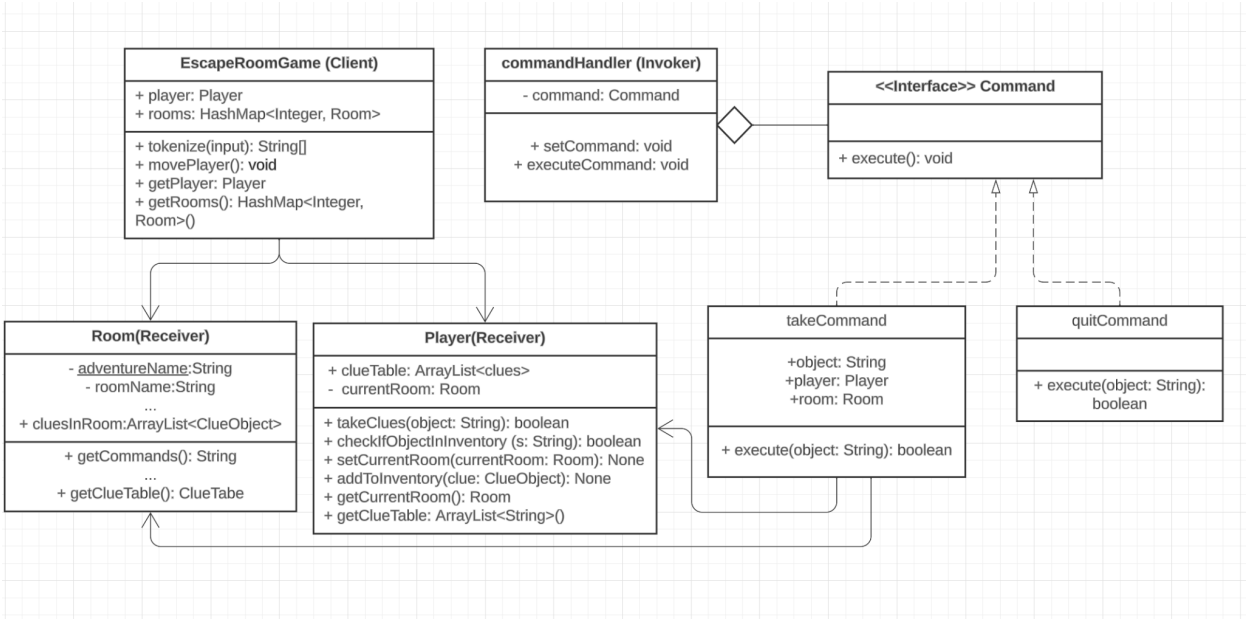
Play minigame	8	Given I am a player, When I am in a specific room, it requires me to play a minigame/get through a puzzle. Then, I will be able to access the clues of the room.
~~Number of Attempts~~	~~9~~	~~Given I am a non-sighted player,~~ ~~And when I enter a game inside a room,~~ ~~I need to be aware of the number of attempts I have,~~ ~~before I completely lose the game.~~
Clues	10	Given I am a deaf player, When I need to navigate through a room, I will look for objects/hints/clues that will help me formulate a password. ~~I will be allowed to zoom into clues for better vision~~. Then with that clue, I escape/progress to the other room and repeat. And, I can complete the escape room game.
~~Knowledge~~	~~11~~	~~Given I am a player,~~ ~~And when I successfully get into a room, I will see new images and text which make me aware and understand the game.~~ ~~Then, I can make wise decisions to continue through the room.~~ ~~And, I can play the game with efficiency and complete it within the time limit.~~
~~Inventory~~	~~12~~	~~Given I am a player, and I try to see my previously collected clues, and I come across an Inventory button, when I click the button, then I am able to see a list with the clues I have previously collected, and I can use the clues to guess the password to get into the next room~~
Inventory Audio	13	Given that I am a non-sighted player, interacting with the inventory when I navigate the inventory, I come across an "Inventory Audio" button. When I click it, it plays an audio listing the clues in my inventory.
Exit Button	14	Given I am a player, and I want to exit the game, and I navigate the game, I come across an Exit button, When I click it, it exits the game
Restart Button	15	Given I am a player, and I want to restart the game, I navigate the game and come across a restart button. When I click the button, it erases my progress and places me in the starting point of the game.
Instructions	16	Given that I am a player, And I come across the "instructions" button, When I click on the button, Then I find clear and comprehensible information provided through text and audio about the game objectives, controls, rules, commands and special features.
Time	17	Given that I am a player, And I want to know the time remaining to escape all 4 rooms, When I look at the top of the screen at any given time, Then I find the time written in easily readable text with a large font size and a readable font.

Audio Time	18	Given that I am a blind player, And I want to know the time remaining to escape all 4 rooms, When 10 minutes pass by, Then I hear the amount of time left to escape all 4 rooms in a loud and clear voice.
Hint	19	Given that I am a player, And I have discovered all the clues in the current room, When I click or press enter on the hint button and I have obtained all clues in the room, Then I find clear and comprehensible information provided through text informing me how to put all of my clues together to correctly guess the password to enter the next room. Otherwise, a warning is displayed informing me to collect all clues.
Audio Hint	20	Given that I am a non-sighted screen reader user, And I have discovered all the clues in the current room, When I click or press enter on the hint, Then I hear clear, comprehensible, and loud information provided through audio informing me how to put all of my clues together to correctly guess the password to enter the next room.
~~Change Background Color~~	~~21~~	~~Given that I am a player,~~ ~~And I launched to the view of the game that has a black background color and want to change the background color of the gameView to white color,~~ ~~When I click on the button labeled "white".~~ ~~Then I see the background color of the game view change to white color.~~
Saved-Folder	22	Given I am a player, And I enter the game screen, I want to be able to see the images of room and room objects Then, I will hear the description of the room and the room
Guess Password	23	Given I am a player, And I am attempting to escape the rooms, When I enter the password for the current room, Then, if the password is correct, I move to the next room and continue the escape process.
Display Victory	24	Given I am a player, And I successfully navigate and escape from all the challenging escape rooms, When I enter the correct password for the final room, Then, I see a victory notification, celebrating my success and concluding the game.
View MiniGame Clue Answer	25	Given I am a player, And I am actively trying to solve mini-game clues to progress, When I choose to view a clue's answer, Then, if the clue is in my inventory, I receive the correct answer to help me in correctly guessing the password for the current room.

Design Pattern #1: Command Pattern

(Modify the UML for more simplicity)

Overview: This pattern will be used to implement, takeCommand and quitCommand actions.



Implementation Details: The UML diagram outlines multiple components such as:

- The *Command* interface, which serves as the interface for classes *takeCommand, quitCommand.* The classes *takeCommand, quitCommand,* and *showCommand* encapsulate the specific action to be performed.

- The *commandHandler* interface, which executes the specific commands based on the player's input.

  In the *movePlayer() method,* the *EscapeRoomGame,* which is the Client, has the *Player* and list of *Room.* It receives the *Command* object from the *EscapeRoomGameController,* and instantiates the *commandHandler* that stores that specific *Command* object.

  The *execute* method of the *commandHandler* will require a command. The *commandHandler* can execute the command by calling the executeCommand() method based on the specific *Command* object that it stored. The *commandHandler* will either take the object of the Room (*takeCommand*) or quit the game (*quitCommand*).

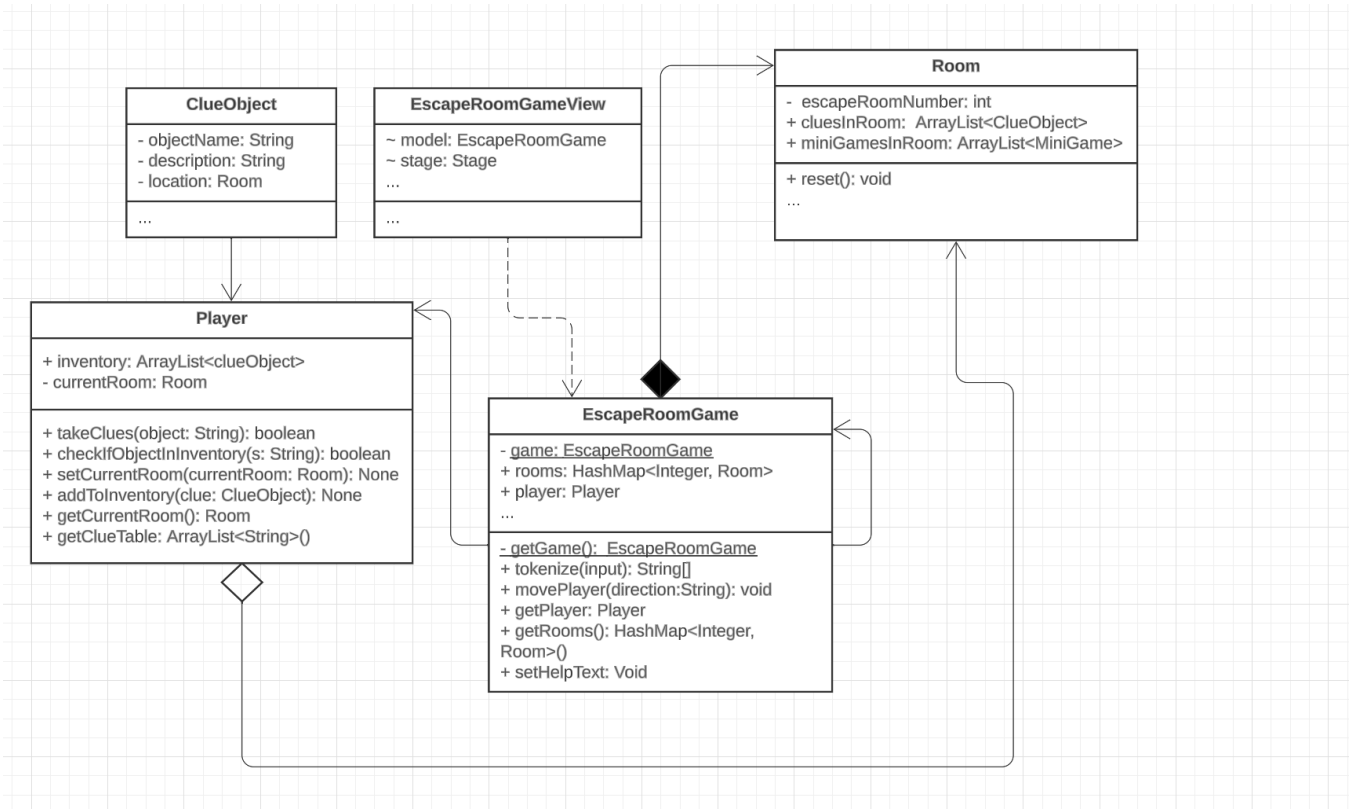
  The *takeCommand* contains the *Player*, and signals the *Player* (receiver) to perform the

action of adding the clue to the *Player*'s ClueTable List and the *Room* (receiver) to remove the clue from the *Room*'s cluesInRoom list.

Design Pattern #2: Singleton Pattern

(Modify the UML with added static methods + instance)

Overview: The UML diagram provided outlines the structure for an escape room game application.



Implementation Details: The UML diagram outlines multiple classes such as:

- *EscapeRoomGame*: This is the center class that manages the game. It holds a list of rooms and the player, a list of mini-games, as well as a static variable that returns the same EscapeRoomGame instance.

- *Player*: This class manages the player's state within the game, including their inventory of clue objects and their current room.
- *Room*: A class to represent each room within the escape room game. It contains clues and a mini-game specific to that room. The room class contains methods to handle its respective mini-game, including add and remove methods.
- *ClueObject*: Represents an object that can be a clue in the game, with a name, description, and location.
- *EscapeRoomGameView*: Receives input from the user and renders the game state. It communicates with the EscapeRoomGame class to reflect changes in the game.

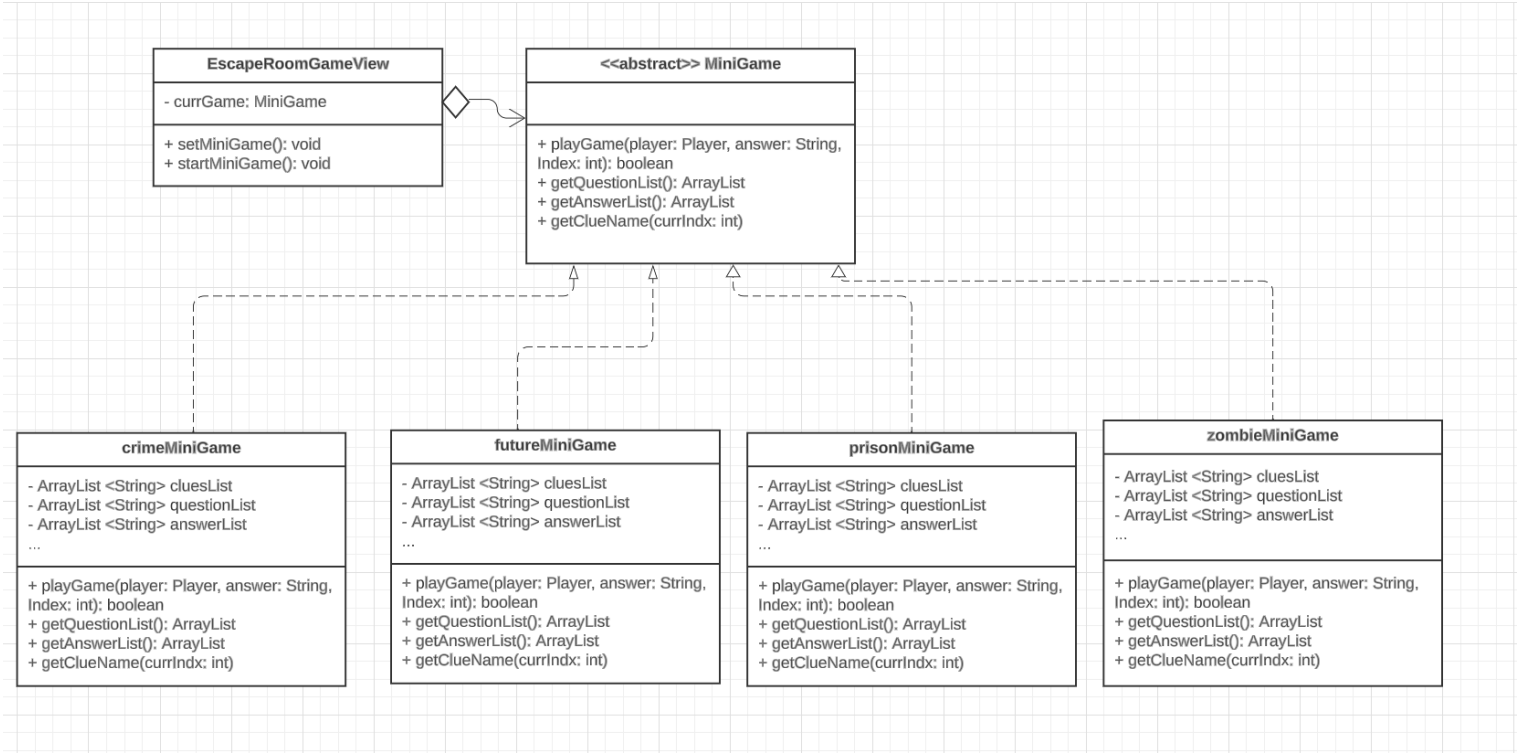
The *Player* class in the escape room game acts upon receiving specific instructions from the command handler. When a player invokes the *takeClues* method, it triggers a sequence where the *Player* adds the clue to their inventory, represented by the inventory list of *ClueObject* instances — and simultaneously, the corresponding *Room* updates its state by removing the clue from its *cluesInRoom* list. Similarly, the *setCurrentRoom* method would update the player's current room status, affecting the player's navigational state within the game.

These actions are coordinated through the *EscapeRoomGame* class, which holds the overall game state, including the map of rooms and the player object. The *EscapeRoomGameView* interacts with the *EscapeRoomGame* to reflect these changes in the user interface, ensuring that the player's actions are accurately represented visually, whether they are collecting clues, moving through rooms, or engaging with the room´s mini-game.

Design Pattern #3: Strategy Pattern

(Modify whole structure of the UML)

Overview: The pattern will enable the dynamic selection of mini-games in an escape room game.



Implementation Details: The UML diagram outlines multiple classes such as:

- The *EscapeRoomView* interface, which methods setMiniGame, startMiniGame, and an attribute: currMiniGame.
- The *MiniGame* interface includes four methods: playGame, getQuestionList, getAnswerList, and getClueName.

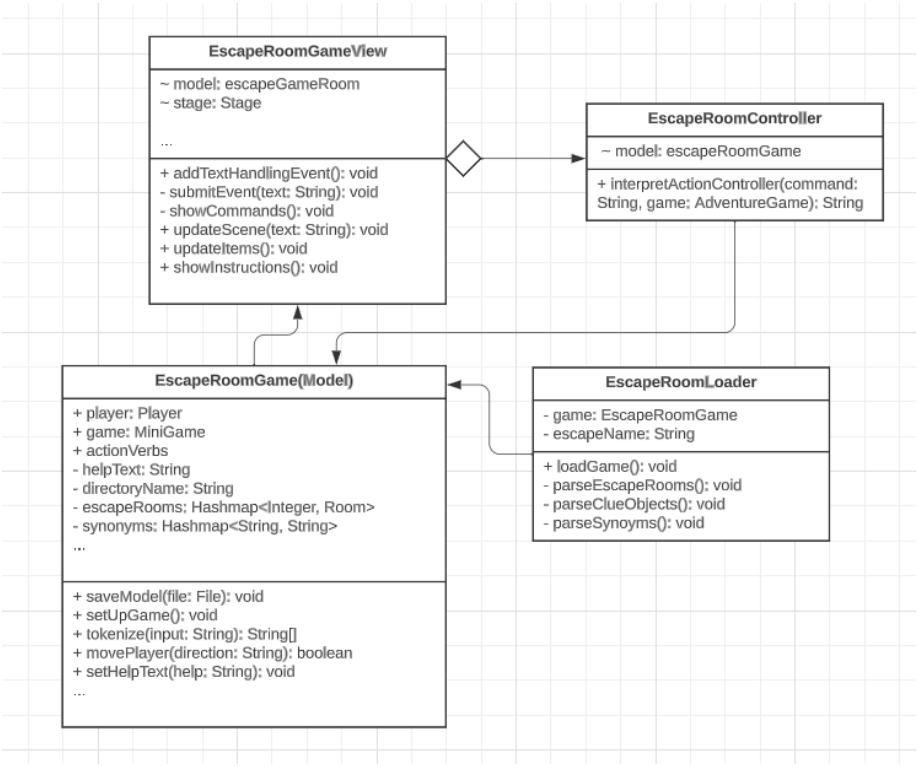
- The *prisonMiniGame, crimeMiniGame, futureMiniGame, and zombieMiniGame* classes all implement the *MiniGame* interface.

This is a UML diagram of a design pattern for an escape room game. The diagram is divided into three sections: *EscapeRoomView*, *MiniGame*, and four types of minigames including *prisonMiniGame*, *crimeMiniGame*, *futureMiniGame,*and *zombieMiniGame*. The *EscapeRoomView* interface is on the left side of the diagram, maintains a reference to the concrete strategies and communicates with this object only via the *MiniGame* interface. The *MiniGame* interface is in the center of the diagram and is common to all concrete mini-games. It declares a method the *EscapeRoomView* uses to initialize and play a mini-game. The *prisonMiniGame*, *crimeMiniGame* and *futureMiniGame,* and *zombieMiniGame* classes both implement the *MiniGame* interface. Each class represents the games for specific rooms in the escape room game. The methods in the interfaces allow for the initialization and playing of the mini-games within the escape room game. This design pattern allows for a flexible and modular approach to building an escape room game, where new mini-games can be easily added or existing ones modified without affecting the overall structure of the game.

Design Pattern #4: MVC Pattern

(Slight Modification with the Variables + Methods)

Overview: The pattern will represent the application's data and business logic. It encapsulates the data's structure and manages its state.



Implementation Details: The UML diagram outlines multiple components such as:

- escapeRoomController class, which acts as a mediator between the model and the view, and usually sends information sent from view to execute it in the model.
- escapeRoomView class, which initializes the UI and represents the game on the screen. Receives user input and updates the UI based on the state of the game.
- escapeRoomLoader, which loads the data needed for the escape room, the model then uses this data to drive the game.

The escapeRoomLoader takes information and loads it into the game, which is what escapeRoomGame uses to drive the game and execute the methods required to play it. When there is a change in the game state, the update is sent to the Controller, which is responsible for sending it to the escapeRoomView, which ensures that the update is reflected in the interface

The escapeRoomView represents the game to the user in a graphical interface and receives updates from the model to reflect them in the interface. The escapeRoomView also accepts input sent from the user and then sends the input to the EscapeRoomController. Based on the user's actions, the controller communicates with the Model to update the game state.