Use Cases for the Yahtzee Game

UC-01	Player Plays Yahtzee
Description	This use case describes when a new Yahtzee game is started.
Actors	Player, System
Triggering Event	Start of a new Yahtzee Game
Pre-Condition	Game Loaded Successfully
Main Sequence	1. Player selects to play the game with 1-5 players 2. 1-5 player select a valid game name 3. 1-5 players plays a game 4. System adds the score of each player's game to their game total 5. Steps 3-4 are repeated 5 times 6. System reports the game total of each player to the respective player
Post-Condition	A Game is played and the score recorded.
Resulting Event	Yahtzee Game Ends

Alternative Scenarios	***Player plays the game with 2-5 players***
	Player decides to play the game with another player
	1. System decides the turn order for the players
	    a. Each player throws a die that has a value between 1 and 6
	    b. The Player with the highest die value goes first, the second highest next and so on. If two players throw the same die value then their order is determined arbitrarily.
	
	2. System informs players of their turn order.
	
	Player plays the game with 2-5 players and the game ends
	
	1. System compares 2-5 players game total and decides a winner for the entire game.
	    a. The player with the highest score is selected as the winner
	    b. System announces the winner and their score to the rest of the players

NFRs	Players cannot view other players' game scores; they can only see the winner's score. A valid game name consists of only letters and is not taken by another player.
Comments	

UC-02	Player Plays a Game
Description	This use case describes the scenario of a player playing a game
Actors	Player (s), System
Triggering Event	Start of a new game
Pre-Condition	Player has selected their name and the order of their turn
Main Sequence	1. System creates a score sheet for each player 2. 1-5 players play a turn in the game according to their turn order 3. The above step is repeated 12 more times 4. System adds the scores from each player's score sheet and creates a total game score for each player a. If the total score of the upper section in a score sheet is greater than or equal to 63, then 35 points is added to the total score of the game 5. System reports the total of each score sheet to their corresponding player
Post-Condition	A game has been scored
Resulting Event	Game Ends
Alternative Scenarios	**_1-5 players play more than 13 turns_** Player tries to play the 14th turn in a game and receives an error message, informing them that the game has ended. **_Total Score of Upper Section is more than 63_** Player scores more than 63 points in the Upper Section of the score sheet: 1. System adds 35 points to the total game score for the player 2. System reports game score to the player
NFRs	Each player has their own score sheet for the game and cannot access the score sheet of another player. All players must complete a turn in the game before anyone can play the next turn.
Comments	

UC-03	Player Plays a Turn
Description	This use case describes the steps of a player playing a turn in a game
Actors	Player
Triggering Event	Start of a new game or end of another turn in a game
Pre-Condition	Player has scored their previous turn if this turn is not part of a new game.

Main Sequence	1. Player rolls five dice
	    a. System verifies that each dice displays a value between 1 and 6
	2. Player chooses to roll the dice again or proceed to step 3.
	    a. Player chooses to hold 0 or more dice
	    b. Player rolls all un-held dice
	        i. System verifies that each un-held dice displays a value between 1 and 6
	    c. Player goes to Step 3 if they have rolled the dice 3 times (total) and they go to Step 2 if they have not.
	3. Player scores in a scoring category that has not yet been scored
	    a. System validates the player's score

Post-Condition	A category is scored in the scoring sheet of the game
Resulting Event	Player turn ends
Alternative Scenarios	***Player enters an invalid score in a scoring category*** Player scores in a category that they cannot (i.e. don't have the dice values) or they have entered an invalid score in a scoring category 1. Player jumps to Step 3. ***Die in a roll has a value that is not between 1 and 6*** 2. Roll becomes invalid and does not count towards the 3 rolls 3. Player rolls the dice again
NFRs	Players cannot change their score once they have scored in a category unless their score is invalid. Players can only score in **<u>one</u>** category (i.e. they cannot score in two categories when the values of the dice allow; they need to pick a category to score).
Comments	

Operational Variables

Below are the Operation variables for each of the three uses cases.

UC-01: Player plays "Yahtzee Game"

- **Name:** Name of a player that plays the Game. It is a value selected by the user.
- **Multiplayer:** Indicates whether the player has selected to play the game with other players. This option is selected by the user. Values: Yes/No
- **Number of Games Played:** Represents the state of the system. It lists the number of games that a player has player in the Yahtzee Game. Value: 0-6
- **Game Ended:** Represents the state of the system. It indicates whether the main "Yahtzee" game has ended. Values: Yes/No
- **Play a Game:** Input entered by the user. It represents whether the player has selected to play another game. Values: Yes/No.

UC-02: Player plays a Game

- **Number of Turns:** Represents system state, specifically it lists the number of turns that a player has played in a game. Values: 1-13
- **Play Turn:** Input entered by the user. Indicates whether the player has selected to play another turn in the game. Values: Yes/No.
- **Include Upper Bonus:** Represents system state, specifically when to give a player 35 points (when they score 63 points in the upper section of their score sheet). Values: Yes/No.
- **Game Ended:** Represents system state, specifically it indicates whether a game has ended. Values: Yes/No/

UC-03: Player plays a Turn of a Game

- **Dice Values:** Represents system state, specifically the values of the five dice after a roll. Values: Between 1 and 6/Invalid. Invalid is when a die value is not between 1 and 6.
- **Number of Rolls:** Represents system state, specifically the number of times a player has rolled the dice in this turn. Values: 1-3.
- **Roll Again:** Input entered by the user. User selects whether to roll the dice again. Values: Yes/No.
- **Dice Held:** Represents system state, specifically whether the player has held any dice or not. Values: Yes/No.
- **Scoring Category Available:** Represents system state, specifically it indicates whether the scoring category that a player has chosen to score in has already been scored by the player. Values: Yes/No.

- **Score Entered:** Input from the user. User enters a score between 0-50 that they would like score in a specific category. Values: 0-50
- **Actual Score:** Represents system state, specifically it lists the score that is valid for a category given the values of the five dice thrown. Values: 0-50.

Operational Relation for Use Cases

Operational Relation for the "Player Plays Yahtzee" use case							
Operation Variables						**Expected Result**	
Variant	**Name**	**Multiplayer**	**Number of Games Played**	**Game Ended**	**Play a Game**	**Message**	**Game Action**
1	Invalid	DC	0	No	No	The name that you have selected is invalid. Please select another name.	Player selects another name.
2	Valid	Yes	0	No	No	Please roll the die to determine the order of your turn.	Each player rolls the die to determine the order of their turn. System determines the turn order and informs players of their turn order.
3	Valid	DC	4	No	Yes	None	Each player plays a game, and the system adds the score for the game to the player's game total.
4	Valid	DC	5	Yes	No	Your total score for the game is the following.	System reports the total game score for each

						player to them respectively.
5	Valid	Yes	5	Yes	No	The winner for the game is the following player.	System decides a winner for the game and announces the winner and their score to all the players.

Operational Relation for the "Player plays a Game" use case						
Operation Variables					**Expected Result**	
Variant	**Number of Turns**	**Play Turn**	**Include Upper Bonus**	**Game Ended**	**Message**	**Game Action**
1	12	Yes	No	No	None	Player(s) play a turn in the game.
2	13	No	DC	No	None	System adds the scores for each player from their score sheet and creates a total for each player.
3	13	No	Yes	No	None	System adds 35 points to player's game total.
4	13	No	DC	Yes	Your total score for the game is below.	System reports the total game score for each player to them respectively.
5	13	Yes	DC	No	You cannot player more than 13	None

| | | | | | | | | turns in a game. The game has ended; please wait to receive your score. | |

Operational Relation for the "Player plays a Turn" use case									
Operational Variables								Expected Result	
Variant	Dice Values	Number of Rolls	Roll Again	Dice Held	Scoring Category Available	Score Entered	Actual Score	Message	Game Action
1	1-5 dice have a value that is not between 1 and 6	DC	DC	DC	DC	DC	DC	The value of the dice is not between 1 and 6. Please roll again.	Do not count the invalid roll in the total number of rolls, and roll the dice again.
2	All five dice have values between 1 and 6	1	Yes	No	DC	DC	DC	None	Roll all five dice and update their values
3	All five dice have values between 1 and 6	2	Yes	Yes	DC	DC	DC	None	Keep the values of the held dice. Roll the un-held dice and update their values.
4	All five dice have values between 1 and 6	3	Yes	DC	DC	DC	DC	You cannot roll the dice more than three times in a turn. Please score your turn in the score sheet.	None

5	All five dice have values between 1 and 6	DC	No	DC	Yes	Value between 0 and 50	Matches Entered Score	None	Update the score in the scoring category to the entered score.
6	All five dice have values between 1 and 6	DC	No	DC	Yes	Value between 0 and 50	Does not Match Entered Score	The score you have entered is invalid for this category. Please select another scoring value.	None
7	All five dice have values between 1 and 6	DC	No	DC	No	DC	DC	This category has already been scored. Please select another scoring category.	None