

Business Function Modeling

Highest Level Function

- Play a 2 deck game of Card Farkle with multiple (2+) players

General Functionality

- Start a new game of Card Farkle
 - Display a start screen which does the following:
 - Ask the user how many players will be in the game
 - Create an empty running sum for each player
 - Initialize the card decks
 - Player takes turn
 - Draws and displays 8 cards to the user
 - Determine if none of the 8 cards are scorable (Farkle)
 - Otherwise, allow the user to
 - Select cards to be kept or reshuffled
 - Check if user wants to score their current points, or to go for another hand
 - Reshuffle cards into
 - Check to see if player hit initial 500 points
 - Score hand of player
 - Determine if the player has more than the 500 point threshold
 - Adds points to players running sum based on hand
 - Display scores of each player on scoreboard
 - Switch to next player's turn
 - Loop to Player takes turn protocol
 - Finish a game
 - Determine if a player has reached 10,000 points
 - Display final scoreboard
 - Ask the user if they would like to play again
 - Start a new game if appropriate, otherwise quit
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Functional Requirements Narrative

To begin a new game of Card Farkle the first step is to Display the startup welcome screen that will ask the user how many players are playing in this game. Empty running sums will be created for every player, the decks of cards are then initialized and shuffled, and the main game screen is displayed after the user starts the game. The player's turn begins as eight random cards are drawn from the deck and displayed to the user. The displayed cards are first checked that there is a scorable option, if not, it is a farkle and any points that the user had summed up in their turn is discarded and the turn moves to the next player; otherwise, the user is hinted with possible scoring options that they can choose. Once the user selects the scoring options, they may choose to bank their score and end their turn, or they can choose to draw new cards from the deck equal to the number of cards not held for scoring. If the player chooses to bank their points, the game checks if it is the user's first points added to the board, if it is then the sum must be greater or equal to 500 points, otherwise the user must keep playing until the minimum first point threshold is reached. When the points banked, the score is added to the player's running sum, and the turn moves to the next player. Next to the panel displaying the cards in play, there is a scoreboard showing the up-to-date totaled scores for each player, as well as whose turn it currently is. After every player's turn the sums are checked against the winning point threshold of 10,000 points. The player that first crosses this threshold is tentatively elected the victor, as all players besides the player that crossed the point threshold get one more turn to try and upset the victor. The final scoreboard is then displayed and a message prompts the user to either play again, or to quit the game.

List of Requirements and System Test Plan

Requirement ID	Requirement	Verified By
1A	<u>Start a new game of Card Farkle</u>	
1B	To begin a new game of Card Farkle the first step is to Display the startup welcome screen that will ask the user how many players are playing in this game.	Test Case 1 Step 1
1C	Empty running sums will be created for every player, the decks of cards are then initialized and shuffled, and the main game screen is displayed after the user starts the game.	Test Case 1 Step 2
2A	<u>Player takes turn</u>	
2B	The player's turn begins as eight random cards are drawn from the deck and displayed to the user.	Test Case 1 Step 2

2C	The displayed cards are first checked that there is a scorable option, if not, it is a farkle and any points that the user had summed up in their turn is discarded and the turn moves to the next player;	Test Case 1 Step 3
2D	otherwise, the user is hinted with possible scoring options that they can choose.	Test Case 2 Step 3
2E	Once the user selects the scoring options, they may choose to bank their score and end their turn,	Test Case 2 Step 4
2F	or they can choose to draw new cards from the deck equal to the number of cards not held for scoring.	Test Case 3 Step 4
3A	<u>Score hand of player</u>	
3B	If the player chooses to bank their points, the game checks if it is the user's first points added to the board, if it is then the sum must be greater or equal to 500 points,	Test Case 2 Step 5
3C	otherwise the user must keep playing until the minimum first point threshold is reached.	Test Case 3 Step 5
3D	When the points banked, the score is added to the player's running sum, and the turn moves to the next player.	Test Case 2 Step 5
3E	Next to the panel displaying the cards in play, there is a scoreboard showing the up-to-date totaled scores for each player, as well as whose turn it currently is.	Test Case 2 Step 5
5A	<u>Switch to next player's turn</u>	
5B	as well as whose turn it currently is.	Test Case 2 Step 6
6A	<u>Finish a game</u>	
6B	After every player's turn the sums are checked against the winning point threshold of 10,000 points.	Test Case 2 Step 7

6C	The player that first crosses this threshold is tentatively elected the victor, as all players besides the player that crossed the point threshold get one more turn to try and upset the victor.	Test Case 2 Step 8
6D	The final scoreboard is then displayed and a message prompts the user to either play again, or to quit the game.	Test Case 2 Step 8

Test Case 1:

1. Starting a new game and enter amount of players in game
2. Start hand for a single user
3. Play hand to where there is no scorable option

Test Case 2:

1. Starting a new game and enter amount of players in game
2. Start hand for a single user
3. Play hand to where there is a scorable option
4. Select scorable option and bank score for that round (500+ points)
5. Bank a score that is 500+ points
6. Switch to next player
7. Play until a player reaches 10,000 points
8. Give other players one more turn to get to 10,000 points

Test Case 3:

1. Starting a new game and enter amount of players in game
2. Start hand for a single user
3. Play hand to where there is a scorable option
4. Select scorable option and redraw unchosen cards
5. Try to bank a score that is less than 500 points

The complete model available on SharePoint

Start a new game

- Display game configuration from previous game
- Ask the user if they would like to change configuration
- Prompt for new configuration values
- Store new configuration
- Set up a scorecard

Take a turn

- Build an initial hand by rolling all dice
- Determine if rerolls are available
- Prompt user to keep dice
- Reroll dice not kept
- Determine whether to proceed to scoring
 - Determine if all dice have been kept
 - Determine if all available rolls have been used

Score a hand

- Determine which scorecard lines are unused
- Calculate the score for each unused line
- Display the calculated scores to the user as possible scoring options
- Prompt the user to select a scoring option
- Record score of selected option on the appropriate scorecard line

Display a scorecard

- Display the score for each upper scorecard line
- Calculate and display total of upper scorecard lines
- Determine if a bonus was achieved
- Display total of upper scorecard lines including bonus
- Display the score for each lower scorecard line
- Calculate and display total of lower scorecard lines
- Calculate and display the grand total

Finish a game

- Determine whether any scorecard lines remain unused
- Display final scorecard when all scorecard lines have been used
- Ask the user if they would like to play again
- Start a new game if appropriate

Each requirement verified by testing

Turning the Functional Requirements narrative into a list of requirements

Requirement ID	Requirement	Verified By
1.0	Starting a new game	
1.1	To start a new game the first step is to retrieve the configuration values that were used the last time a game was played.	Test case 2, step 5
1.2	The very first time a game is played the traditional Yahtzee configuration should be used.	Test case 1, step 5
1.3	The configuration values should be displayed to the user.	Test case 2, step 5
1.4	The user is then asked whether they would like to change the configuration.	Test case 2, step 6
	And so on...	

Building a System Test Plan

Determine the different scenario or test cases required

Test case 1 – Starting a new game when no previous game had been played

Test case 2 – Starting a new game when a previous game had been played

And so on...