

# Java Assignemnt

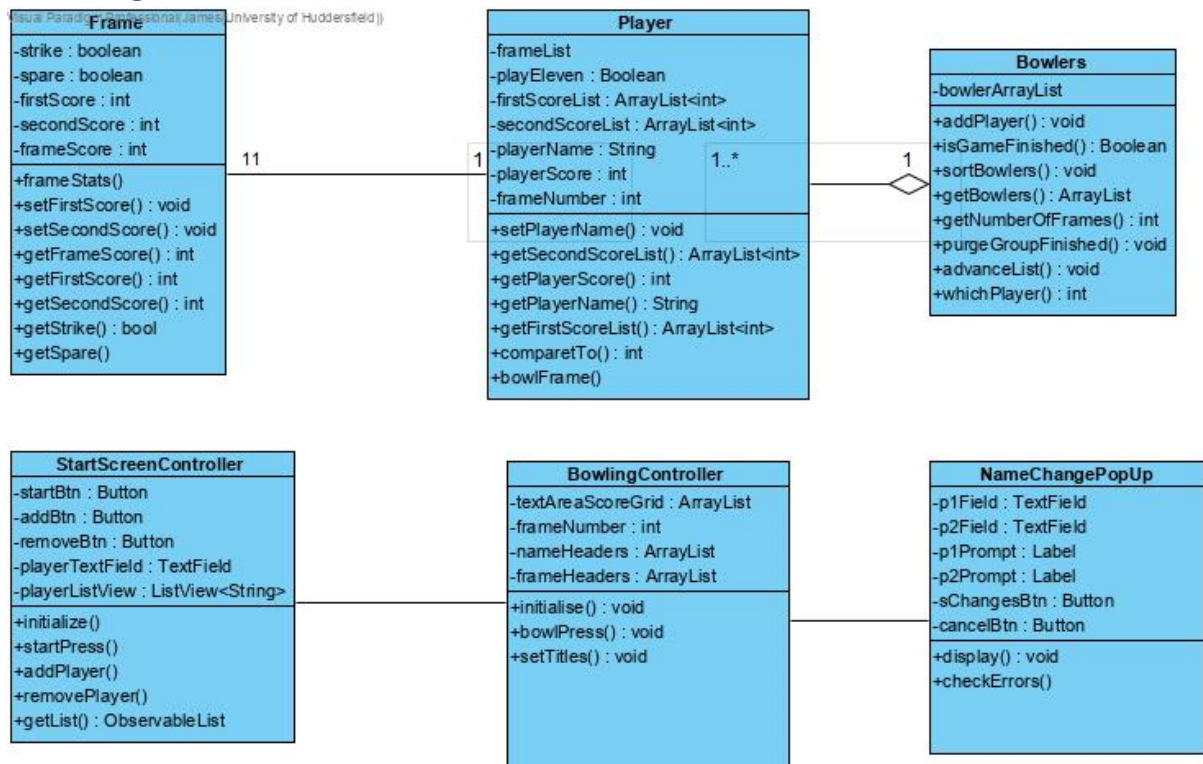
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J.Pawson U1951078



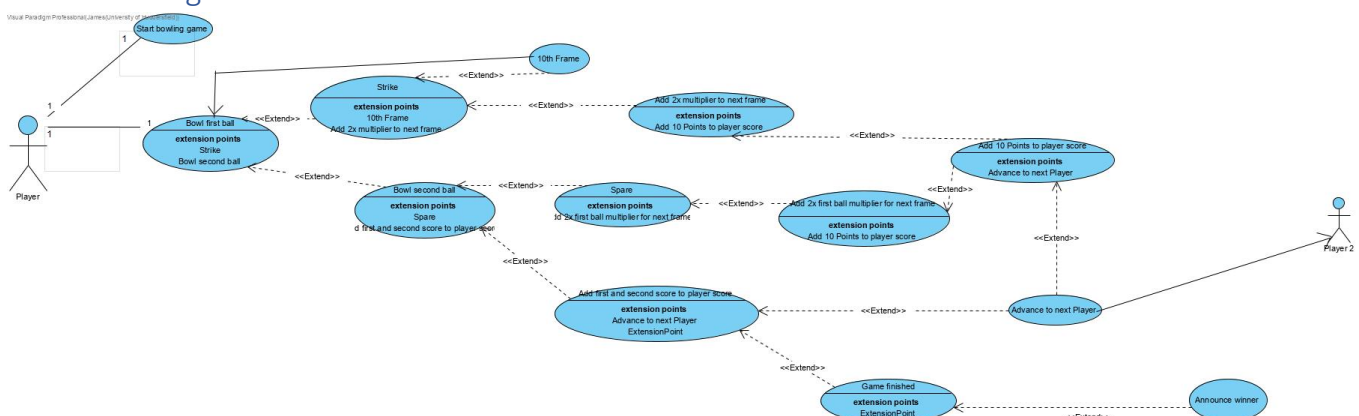
## Design:

## Class Diagrams:



Each player gets a fixed number of 11 frames, I chose to include the 11<sup>th</sup> by default but not grant access to it if the player didn't meet the requirements (bowling a spare or strike on the 10<sup>th</sup> frame). There can be 1 or more player objects in the Bowler class, the Bowler class sorts players based on score which in-turn decides the winner of the game. As displayed by the aggregation relationship, multiple Player objects make up the bowler class.

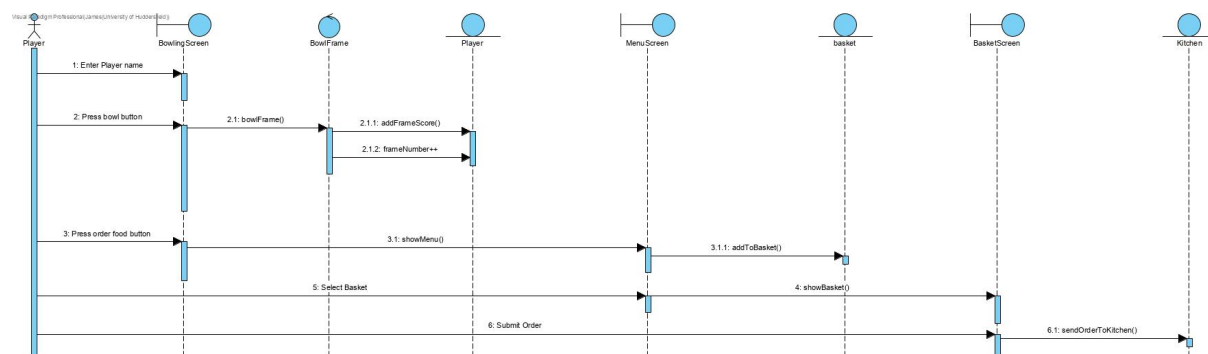
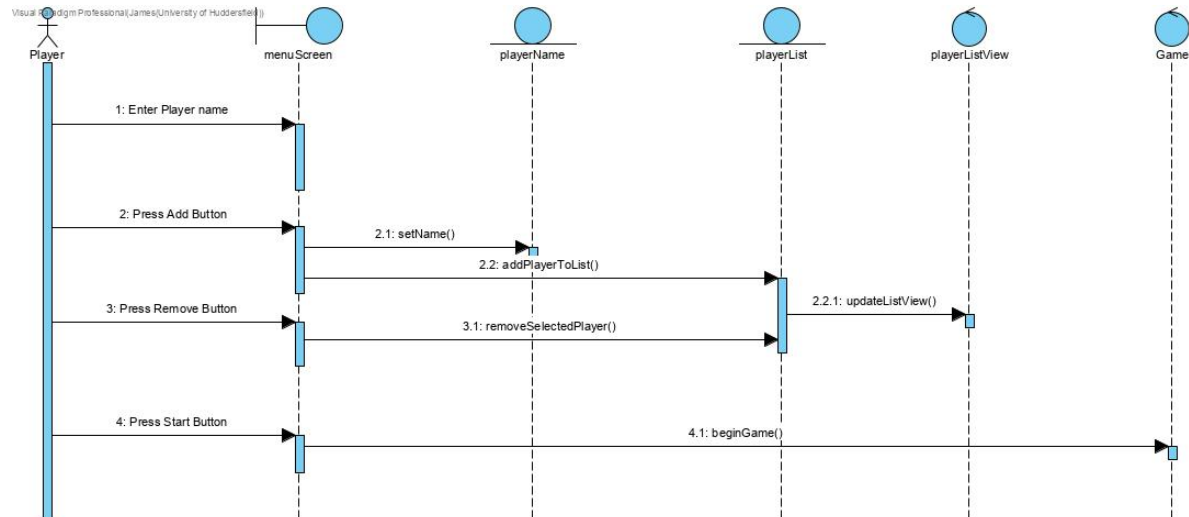
### Use Case Diagram:



In terms of bowling, the player will only be able to directly interact with the bowl button. This will complete the frame for the player bowling both balls at once. The reason I made the design decision

to have one press of the button to complete the frame is because the frame stats are calculated after every button press.

### Sequence Diagram:

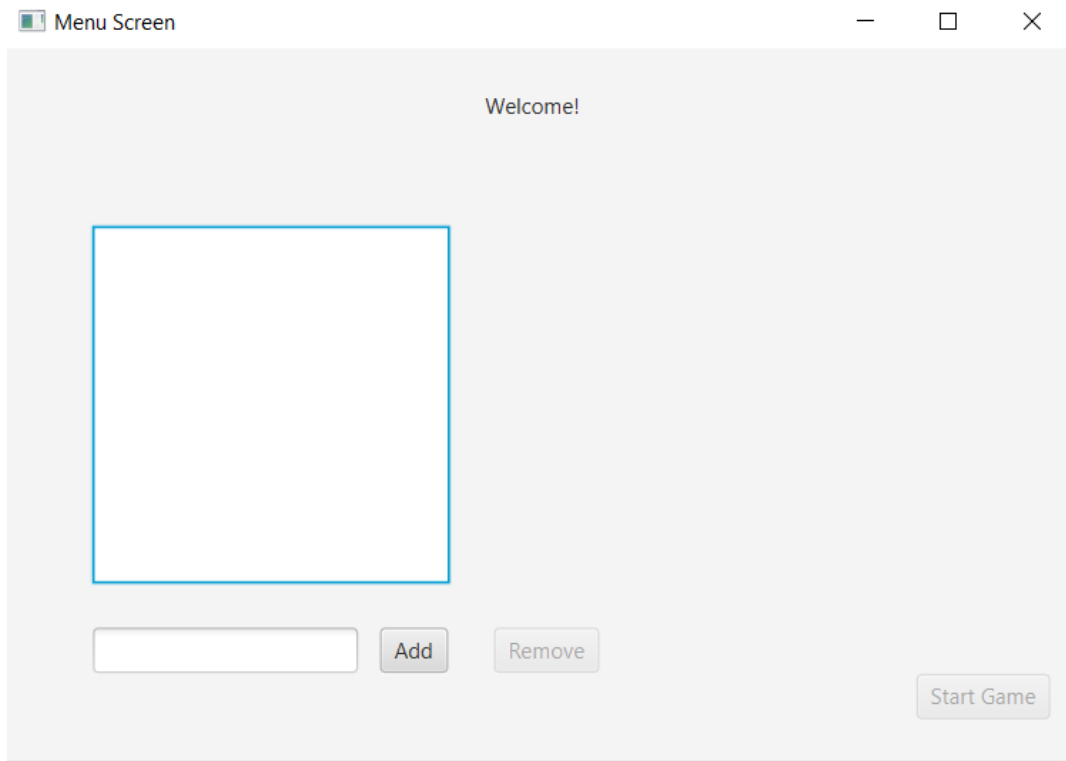


The menu screen is displayed when the program first launches, this is where the players can enter their names. These names are added to the list view when the add button is pressed but can also be removed by selecting the name in the list view and clicking the remove button. Due to the program only being capable of working with two players the add button is disabled when two players are entered. They can still be removed if the players are unhappy with the names and want to enter something different. The start game button is only enabled when there are two players in the player list.

After the start game button is pressed a new scene appears with the game window. The player cannot return to the start scene.

## Testing:

### Menu Screen:



This is the menu screen the players are greeted with when first launching the app. The remove and start game buttons are greyed out so the player cannot start a game with no players or try to remove when no player is available.

Adding a new player: **Pass**

Test Number	Test Case	Expected Result	Actual Result
1	Making a new player	The string is added to the list view and when the game starts it is one of the player names	The string is added to the list view and when the game starts it is one of the player names

The screenshot shows a web application with two side-by-side panels, both titled "Welcome!".

**Left Panel:**

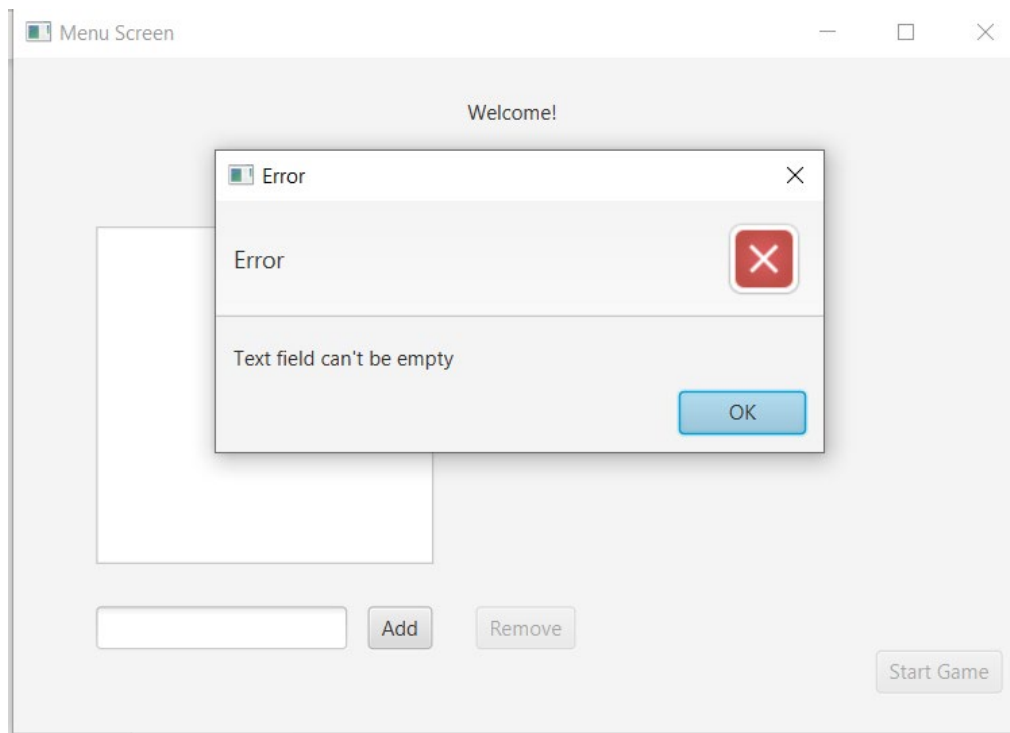
- A large, empty square box.
- Below it, a text input field containing the text "James".
- To the right of the input field are two buttons: "Add" and "Remove".

**Right Panel:**

- A list view with a header "James" and several empty rows below it.
- Below the list, there is a text input field.
- To the right of the input field are two buttons: "Add" and "Remove".

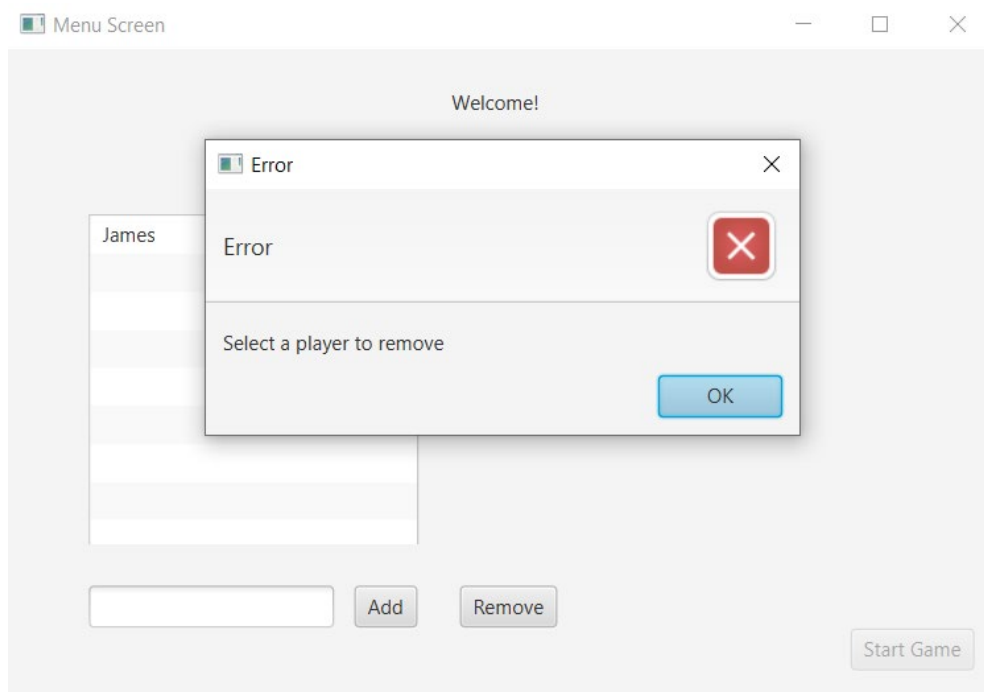
Blank name test: **Pass**

Test Number	Test Case	Expected Result	Actual Result
2	Enter a blank name for a player	An alert will be shown describing error and the blank player will not be added	The user cannot leave the text field blank and press add as it will display an alert instead of attempting to add a blank string into the list view. This successfully stops the program from starting the game with a blank player name.



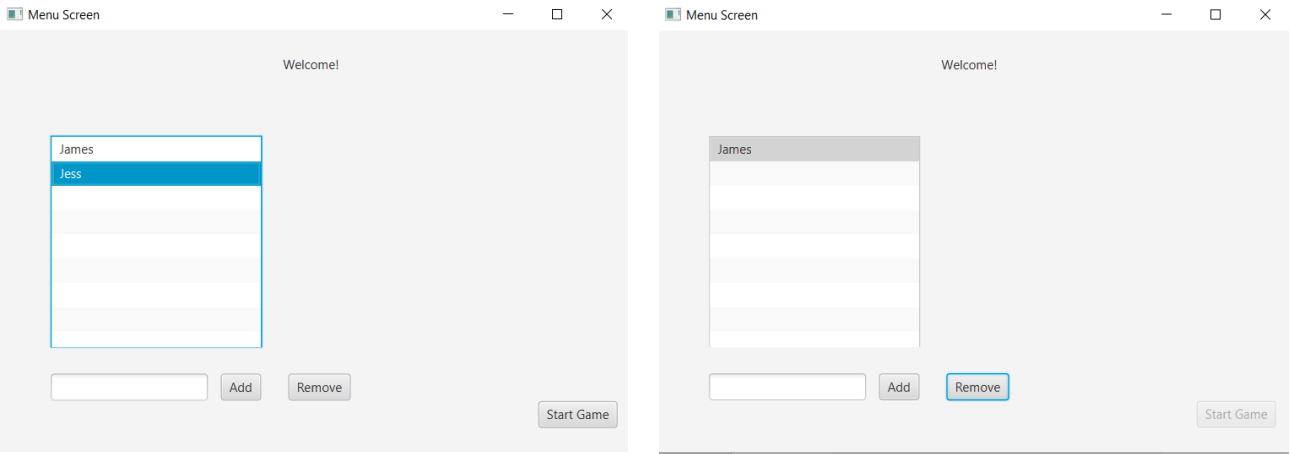
Remove Empty Player: **Pass**

Test Number	Test Case	Expected Result	Actual Result
3	Trying to remove a player without selecting one from the list view	An alert will be shown informing a player has to be selected and no player will be removed.	The user receives an alert message when trying to remove a player without selecting one from the list view.



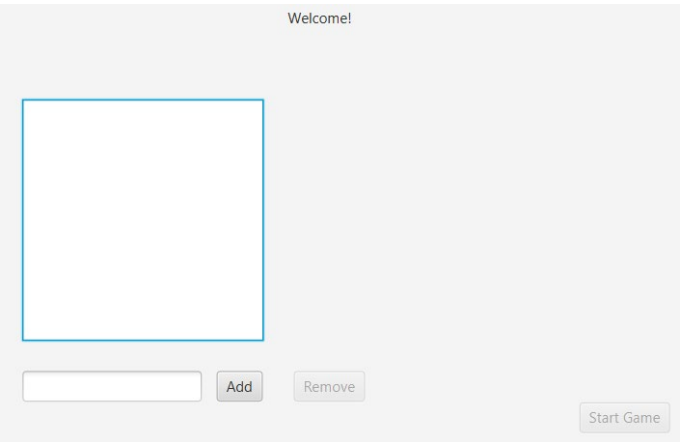
Removing Player: Pass

Test Number	Test Case	Expected Result	Actual Result
4	Attempting to remove a player with one selected	The selected player will be removed from the list view and will not start in the game. The start game button will disable if there are less than 2 players.	Users can successfully remove whichever player they select. The start button returns to being disabled if there are less than two players in the list.



Trying to start the game with incorrect number of players: Pass

Test Number	Test Case	Expected Result	Actual Result
5	Starting a game with no players	The start button is greyed out so the player cannot commence the game	The start button is greyed out so the player cannot commence the game



Test Number	Test Case	Expected Result	Actual Result
5.1	Starting a game with 1 player	The start button is greyed out so the player cannot commence the game	The start button is greyed out so the player cannot commence the game

Welcome!

Jess

Add

Remove

Start Game

Test Number	Test Case	Expected Result	Actual Result
5.2	Starting a game with more than 2 players	The start button is activated but when pressed it will display an alert that prompts the user to only have two players in the list view	The start button is activated but when pressed it will display an alert that prompts the user to only have two players in the list view

Welcome!

Jess

James

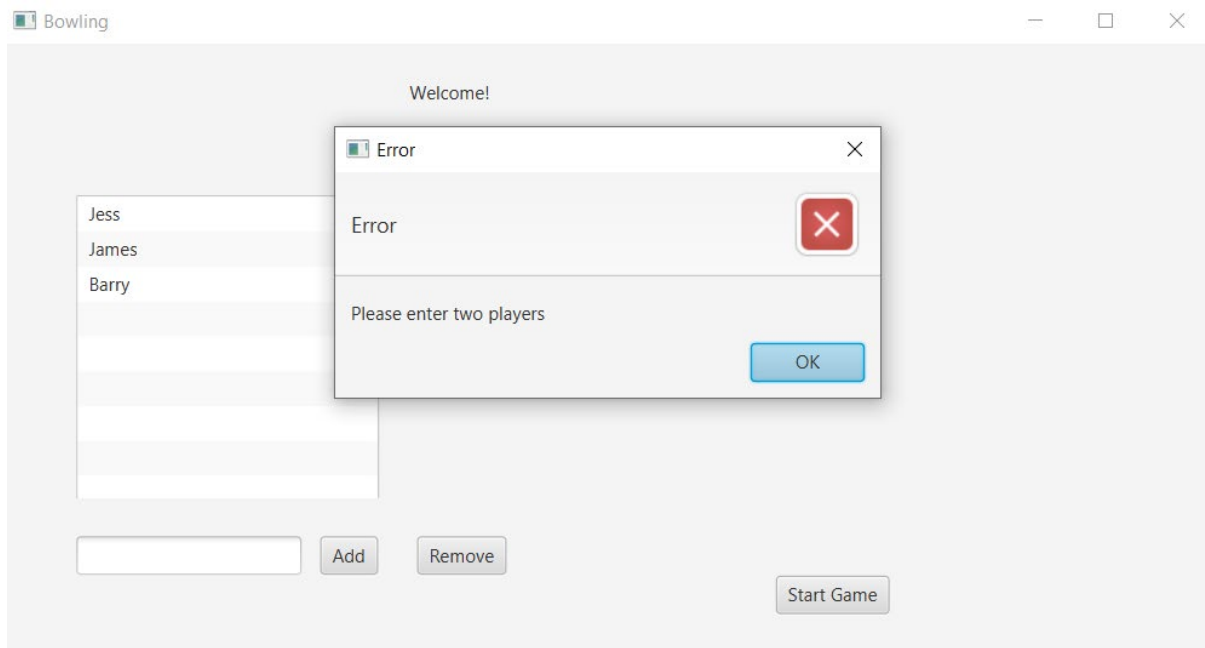
Barry

Add

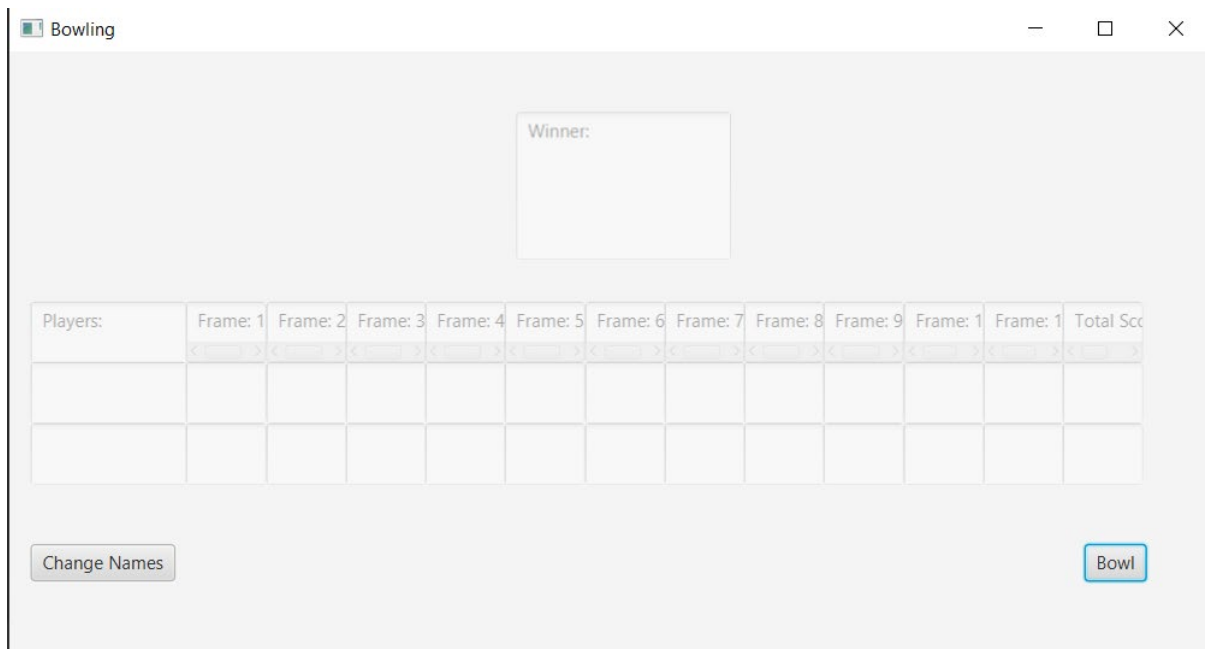
Remove

Start Game





### Main Game Screen:



This is the bowling screen the players see when they begin the game on the menu scene. Once the bowl button is pressed for the first time the players names are loaded in to their respective text area and the first frame is bowled.

### Bowl button test: Pass

Test Number	Test Case	Expected Result	Actual Result
6	Pressing the bowl button to bowl a frame	The frame score will be displayed in the respective frame and the overall player	The frame score will be displayed in the respective frame and the overall player

		score will be updated and displayed	score will be updated and displayed
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Bowling

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 1	Frame: 1	Total Score
James	10 X											10
JEss												

Change Names

Bowl

After each consecutive press one frame each is bowled and the total score added up visible on the end.

Test Number	Test Case	Expected Result	Actual Result
6.1	Randomly generating a players score	A random number between 0 and 10 (inclusive) for the first ball, then the second is a number between 0 and (10 – first score)	A random number between 0 and 10 (inclusive) for the first ball, then the second is a number between 0 and (10 – first score)

Bowling

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 1	Frame: 1	Total Score
James	10 X											10
JEss	9 0											9

Change Names

Bowl

Test Number	Test Case	Expected Result	Actual Result
6.2	Passing the turn on after pressing bowl	The active player will flip to the next in line after bowl is pressed once.	Once the first player presses the bowl button the active player changes to the next inline.

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 1	Frame: 1	Total Score
	< >	< >	< >	< >	< >	< >	< >	< >	< >	< >	< >	< >
James	3 0											3
Jess												

Change Names

Bowl

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 1	Frame: 1	Total Score
	< >	< >	< >	< >	< >	< >	< >	< >	< >	< >	< >	< >
James	3 0											3
Jess	7 0											7

Change Names

Bowl

Test Number	Test Case	Expected Result	Actual Result
6.3	Player 2 passing the turn onto player 1	After pressing bowl whilst player 2 is active it should pass the turn onto player 1.	After pressing bowl whilst player 2 is active it passed the turn onto player 1

Bowling

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
James	3 0	8 0										11
Jess	7 0											7

Change Names

Bowl

Strike test: **Pass**

Test Number	Test Case	Expected Result	Actual Result
7	The player bowls a strike on the frame	In the frame which the strike is scored in "10 X" is displayed to indicate strike. 10 points are added to the player score and the value of the next frame is doubled.	The player has bowled a strike, which adds 10 points to the score but should also double the value of the next frame for the player.

Bowling

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
James	10 X											10
Jess	9 0											9

Change Names

Bowl

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
James	10 X	0 1										12
JEss	9 0											9

Change Names Bowl

The value of the second frame is worth 1 point before the bonus, which means it is worth 8 points in total. The previous score was 16 therefore  $10 + (1 \times 2) = 12$ . The score is correct and therefore the strike bonus works.

Spare Test: **Pass**

Test Number	Test Case	Expected Result	Actual Result
8	The player bowls a spare on the frame.	The player that bowls a spare will have the "[First score] /" displayed in the frame. 10 points will be added to the score and the value of the first ball of the next frame will be doubled.	The spare added ten points, displayed the correct text and gave the 2x multiplier to the first ball of the next frame.

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
James	10 X	0 1	1 4	9 /								27
JEss	9 0	2 1	4 3									19

Change Names Bowl

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
James	10 X	0 1	1 4	9 /	9 0							45
JEss	9 0	2 1	4 3	8 1								28

The first ball of the next frame is worth 9 points and the second ball is worth 0. This makes the value of the frame become 18.

$$27 + (9 \times 2) = 45$$

This is the same as the player score in game which shows the spare bonus working correctly.

Final Score & Consecutive spare Test: **Pass**

Test Number	Test Case	Expected Result	Actual Result
9	Complete the game	The players will finish the game on the correct frame (10 if no strike or spare is gained on 10, 11 if there is). The bowl button will disable and the winner will be declared.	After bowling a full game, the score updates for a final time and a winner is announced. The program is successful in calculating and announcing the winner when the game is finished and therefore passes the test. The bowl button also disables.

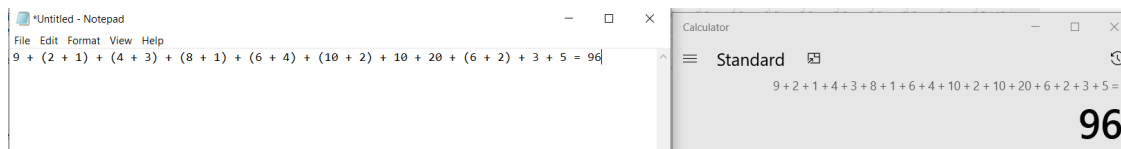
Winner: JEss

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
James	10 X	0 1	1 4	9 /	9 0	10 X	3 2	9 /	8 0	0 1		92
JEss	9 0	2 1	4 3	8 1	6 /	5 2	10 X	8 /	3 2	3 5		96

Change Names Bowl

Test Number	Test Case	Expected Result	Actual Result
10	A player bowls a bonus frame (spare or strike) consecutively	The strike will double the value of the spare to 20 and the spare will double the value of the first ball of the next frame	The score is calculated correctly. See images below to show calculations:

In addition, player 2 scored consecutive spares which I can use for another test.



As displayed the program works with each spare and gets the correct score as it builds up.

#### Eleventh Frame Spare Test: Pass

Test Number	Test Case	Expected Result	Actual Result
11	Player scores a spare on the tenth frame.	Ten points are added to the overall score and the player gets to bowl the first ball on the eleventh frame. Second ball score is default set to 0.	Getting a spare on the 10 <sup>th</sup> frame allows the player to bowl an extra ball, but not the full frame. For simplicities sake I decided to just add another regular frame but in the case of a spare always set the second ball score to 0. Both players score a



			spare in frame 10 and therefore get to bowl one extra ball.
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Bowling

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
,xcv	8 /	5 1	2 0	2 /	5 2	3 3	0 6	4 5	10 X	9 /	9 0	105
,mxc	1 4	3 2	7 /	9 /	8 /	3 6	1 4	1 7	9 0	6 /	6 0	107

Change Names

Bowl

Eleventh Frame Strike Test: **Pass**

Test Number	Test Case	Expected result	Actual Result
12	Player bowls a strike on the 10 <sup>th</sup> frame	Ten points added to the players score. The player who bowls a strike can bowl an extra full frame.	The player who bowled a strike was allowed to play the eleventh frame and 10 points for the strike in the 10 <sup>th</sup> frame were added.

Bowling

Winner: jess

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score
james	9 /	9 0	10 X	0 2	0 0	9 0	6 2	3 4	6 0	2 5		79
jess	2 2	4 2	1 0	6 0	8 1	3 0	1 6	7 1	5 4	10 X	3 /	83

Change Names

Bowl

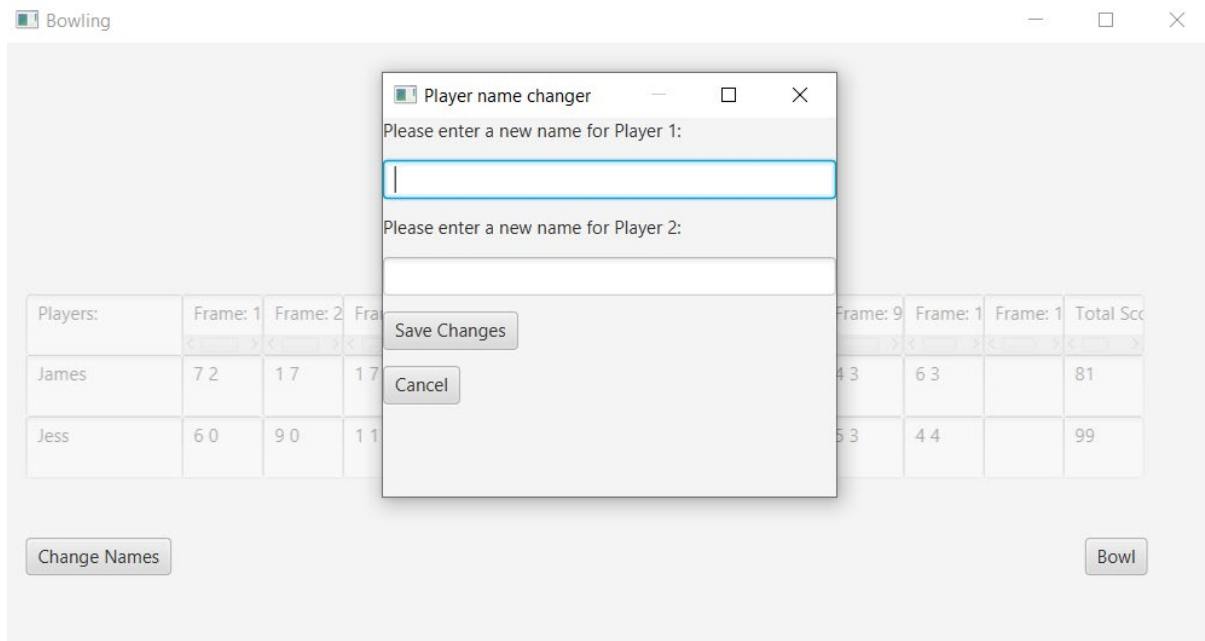
### Eleventh Frame Strike and Spare Test: Pass

Test Number	Test Case	Expected Result	Actual Result
13	One player bowls a strike and one bowls a spare	The player who bowls a strike will have access to the full eleventh frame, the player who bowls a spare will get to bowl one extra ball.	The player who bowled a strike got access to the eleventh frame and the player who bowled a spare got to bowl one extra ball. The scores were added on.

## Change Names Screen:

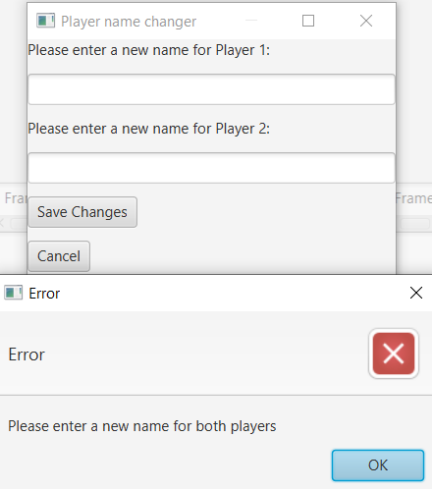
Pressing change names button test: **Pass**

Test Number	Test Case	Expected Result	Actual Result
14	Pressing the Change names button.	A new modal pop up window is displayed with the prompts and text fields to change the player names.	The pop up window is displayed after the button is pressed.

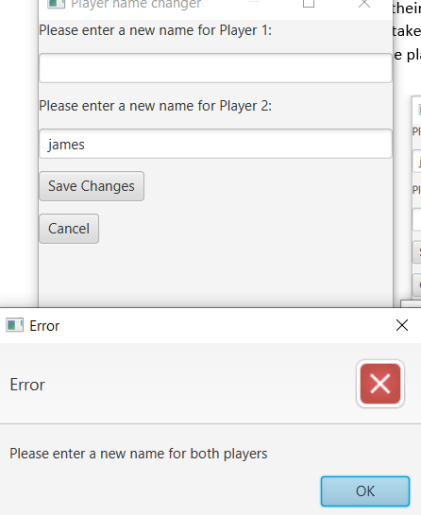


Trying to leave either name field blank and save changes test: Pass

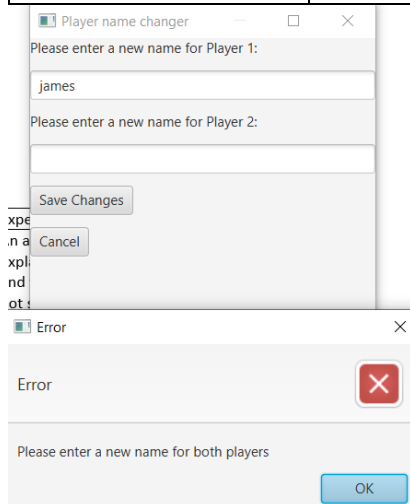
Test Number	Test Case	Expected Result	Actual Result
15	Leaving both name fields blank	An alert is shown to explain the users error and the changes are not saved to prevent a blank player name.	An alert is shown to explain the users error and the changes are not saved to prevent a blank player name.



Test Number	Test Case	Expected Result	Actual Result
15.1	Leaving top name field blank	An alert is shown to explain the users error and the changes are not saved to prevent a blank player name.	An alert is shown to explain the users error and the changes are not saved to prevent a blank player name.



Test Number	Test Case	Expected Result	Actual Result
15.2	Leaving bottom name field blank	An alert is shown to explain the users error and the changes are not saved to prevent a blank player name.	An alert is shown to explain the users error and the changes are not saved to prevent a blank player name.



What doesn't work:

Finishing the game correctly: **Fail**

Test Number	Test Case	Expected Result	Actual Result
16	Finishing a game of bowling	After the final ball is bowled due to the button being pressed a final time the button will disable and the winner will be announced.	The button is required to be pressed several times before the game classes itself as finished and the winner is announced.

Winner:

Players:	Frame: 1	Frame: 2	Frame: 3	Frame: 4	Frame: 5	Frame: 6	Frame: 7	Frame: 8	Frame: 9	Frame: 10	Frame: 11	Total Score									
James	7	2	1	7	4	2	6	2	4	0	8	0	7	/	4	3	6	3		81	
Jess	6	0	9	0	1	1	8	0	8	/	5	/	7	/	7	2	5	3	4	4	99

Change Names Bowl

The program detects the game is finished by counting the number of frames that have been completed by both players. The reason why the game doesn't finish correctly most of the time, is the discrepancy between the number of frames that are needed to handle the eleventh frame results in the bowl button needing to be pressed a number of times after the game is finished. Once the program is satisfied with the number of frames that have been played the winner will be announced and the bowl button will disable.

It should be noted that the game will not add any points or display any score in the eleventh frame if the player does not have access to it.

Changing names during gameplay: **Fail**

Test Number	Test Case	Expected Result	Actual Result
17	Changing the players name using the "Change Names" button during gameplay	The user will enter new names for the players in the fields and the changes will be applied in the game screen and to the object properties	The pop up window displays a changes saved alert and the pop up closes however the changes are not applied anywhere.

