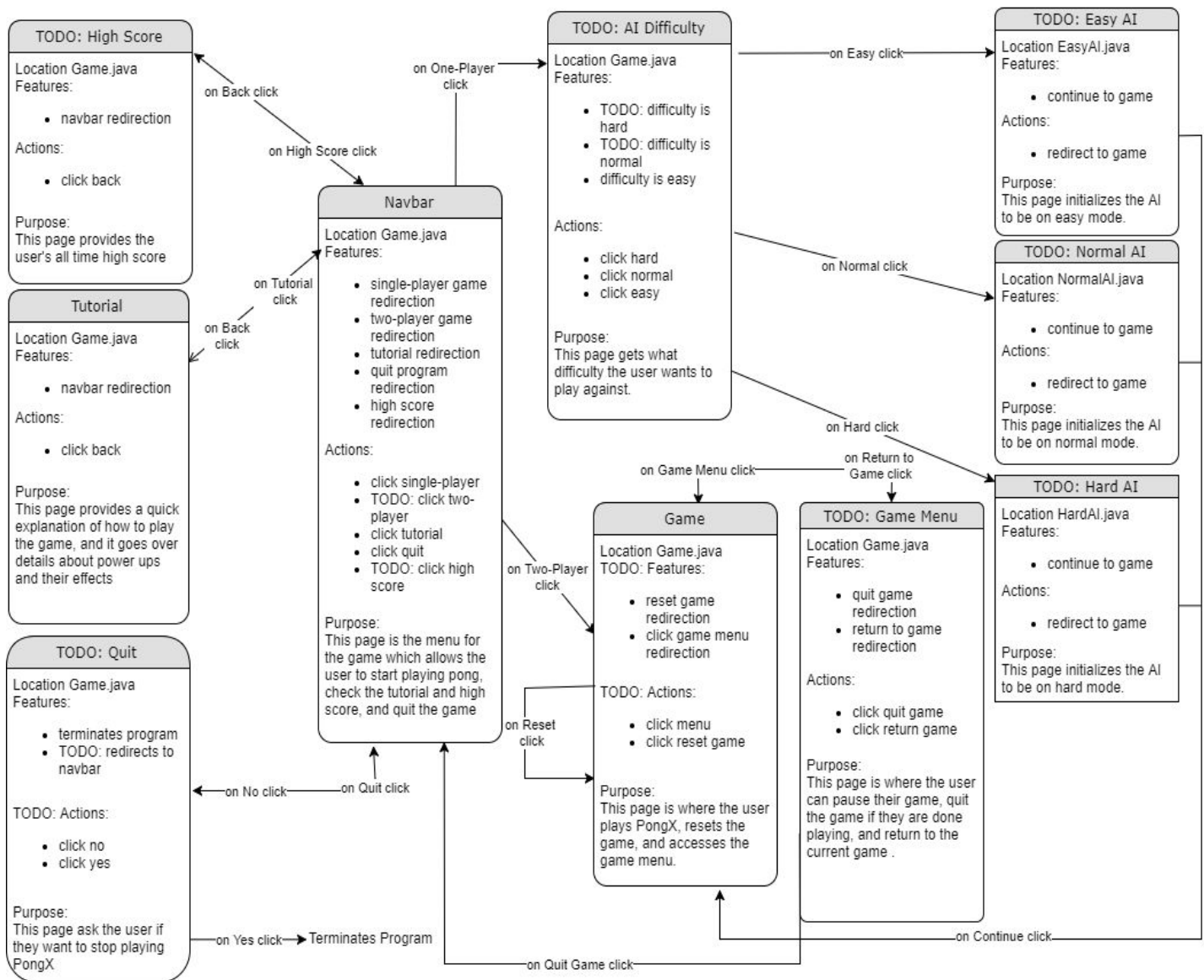




## Team 12 - Incremental and Regression Testing

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## Incremental Testing



- **Defined Components:** See design above for defined components.
- **Type of Incremental Testing Used:** We implemented top-down incremental testing since it would be very difficult to create drivers to test less critical modules such as power-ups. It is far more efficient to test the main modules first using stubs and then building from there. Thus, we tested Game and AI first, followed by the less critical modules such as power-ups and Menu.

#### Frame Module:

Defect No.	Description	Severity	How To Correct
1	Frame was able to be resized and caused bugs with ball collision.	2	Set the resizable variable to false, ensuring that the frame could not be changed while the game is running.
2	Frame would not be responsive.	1	Set the frames visible attribute to true allowing the frame to be responsive.

#### Menu:

Defect No.	Description	Severity	How To Correct
1	Buttons and title aren't properly aligned	1	Adjust location of buttons to match frame size
2	When a new game was created, the frame would not respond	1	Had to set the new games visibility frame to true which would make it responsive.
3	Two-Player button functionality is not working.	2	Created functionality that would launch a game with 2 paddle functionality.
4	High score button functionality is not working.	2	TODO: create a way to store high scores and sort them in sprint 2.

#### Paddles:

Defect No.	Description	Severity	How To Correct
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1	Paddle is unresponsive at times	1	Instead of using KeyListeners we switched to ActionListeners to better respond to our key strokes.
2	Paddle would overlap with frame	2	Remade the bound of which the paddle was allowed to move in.
3	Paddle would shrink till invisible if too many power ups were collected	2	Ensured that the paddle would be visible after a certain point of power up shrinkage.

#### Ball:

Defect No.	Description	Severity	How To Correct
1	Ball physics slightly off when hitting paddles	2	Tweak algorithm for checking when a ball hits a paddle

#### Game:

Defect No.	Description	Severity	How To Correct
1	Does not have a designated score to win	1	Add in a condition that checks if a player has reached a score of 10.
2	Game would not start	1	Created a new game and also set the content pane.
3	KeyListeners do not always read user input	2	Use a different method of reading in user input

#### Powerups:

Defect No.	Description	Severity	How To Correct
1	Powerups keep on stacking onto one another/no cutoff	1	Add flags to the powerups and paddles to only allow 3 power-ups at most affecting each player at most
2	Paddle increase/decrease powerups adjusts the midpoint of the	1	Adjust algorithm of the x and y coordinates when the paddles is increased/decreased

	paddle		
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AI:

Defect No.	Description	Severity	How To Correct
1	EasyAI constructor does not have checks for invalid parameter values	1	Added checks for input ranges.

## Regression Testing

Defect No.	Description	Severity	How To Correct
1	Paddles don't always move due to buggy KeyListeners	2	Change the key listener library we are using because our JFrame keeps losing focus.
2	Ball disappears due to Power-ups making ball too fast/too small	1	Change how often the powerups spawn/change how many powerups effect the ball
3	Frame would not run the game	1	Set the content pane of the frame to the newly created game
4	Game would not respond	1	Set the frame to visible allowing the game to be responsive to user actions.
5	Pause feature doesn't stop the balls and paddles from moving	2	Make the game speed go to 0 when a user presses the pause button
6	Pressing the menu button during a pause didn't go back to menu.	2	Added program states to differentiate when you were in the menu, playing, or paused.
7	When implementing power-ups, it exposed buggy interactions between the ball and paddle	1	Changed how we calculated a ball hitting a paddle to accommodate different ball and paddle sizes.

