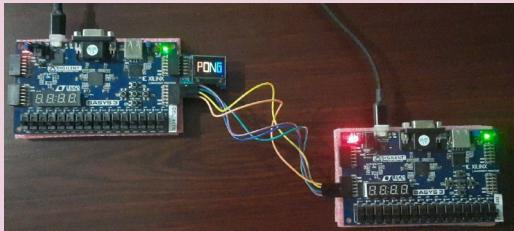
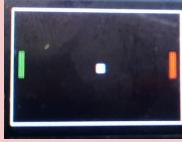
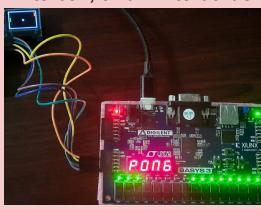


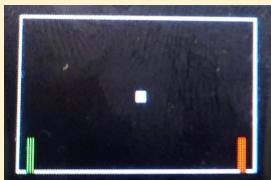
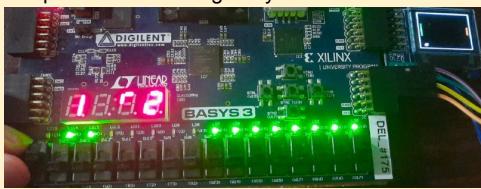
Group ID: Lab B02 Team 6

Member A: Ho Eu Gene (**Matriculation Number:** A0262330U)

Member B: Li Shunyang (**Matriculation Number:** A0288428M)

Member C: How Yong Yang (**Matriculation Number:** A0240012H)

PERSONAL AND TEAM IMPROVEMENTS		
Student and Improvement Name	Improvement Description	Images / Photos
Team “Pong Game”	<p>The system is a two-player Pong Game that allows two players to play a ping-pong game against each other on an OLED display by pressing the buttons on two connected Basys 3 boards. Players may decide when to switch on some of the switches, which will give them a temporary competitive advantage during the game, on the Basys 3 boards. The temporary competitive advantage comprises three power-up functions, each of which can only be used once: Pedal Enlargement, Ball deceleration, and Ball Magnet. The 7-segment display and OLED display will indicate to the players which party is leading during the game and who wins the game respectively.</p>	 <p>When the boards are programmed.</p>
Student A: Ho Eu Gene “Board Connection and Closing”	<p>Dual Board Connection: When the program on the two Basys 3 boards is initialised and the switches are not turned on, the OLED display connected to the main Basys 3 board will show the Home Page of the Pong Game - the word “PONG” in four different colours. Once SW0 of both boards are switched on, both 7-segment displays will show “P0N6”, which corresponds to the name of the game. The lights from LD0 to LD7 and LD13 to LD15 will go live on both boards. The OLED display will now show the green and red pedals adjacent to the white borders on the left and right side of the OLED display, and a white ball at the centre of the display. To enable the pedal movement of Player 2 (which corresponds to the red pedal), SW1 on the second board must be switched on first. The game is now ready to play.</p> <p>Closing: Whenever a player’s score reaches eight (the maximum score one can achieve), the entire OLED display will show the colour of the player’s pedal. For example, if Player 2’s score reaches eight, the entire OLED display will show the colour red or vice versa. To restart the game, switch off SW0 on both boards and switch them on again.</p>	 <p>The 7-segment display shows “P0N6” and the lights from LD0 to LD7 and LD13 to LD15 are live.</p>  <p>The OLED display shows green and red pedals, a white ball, and white borders.</p>  <p>The red pedal can only be moved using buttons (on the second board) only when SW1 is switched on on the second board.</p>  <p>Since Player 2’s score reaches 8, the OLED display turns red as it shows Player 2 wins this game.</p>
Student B: Li Shunyang “Ball Movement”	<p>Ball Direction: When BTNC on the main board is pressed, the game starts and the ball will be released in the direction of either Player 1 (green pedal) or Player 2 (red pedal). However, the ball’s direction will be served in the direction of the last round’s winner in the subsequent rounds. Whenever the ball is released in the previous winner’s direction, there are always four possible angles to be released randomly.</p> <p>Ball Collision: If the ball collides with the top or bottom white border of the OLED display, or either of the pedals, the ball will bounce off. Whenever the ball collides with the left or right white borders of the OLED display, there will be a winner. For example, if the ball collides with the left white border, Player 2 wins this round or vice versa. It also means Player 1 misses the ball or vice versa. Once it hits either the left or right white border, it will stay for 0.6 seconds before returning to the centre of the OLED display. The ball will be released 1.5 seconds after it returns to the centre of the OLED display.</p> <p>Ball Deceleration: At any time during the game, when SW14 on either of the boards is switched on, the ball will slow down</p>	 <p>The game starts only when BTNC on the main board is pressed.</p>  <p>The ball bounces off when it hits the top or bottom white border.</p>

	<p>whenever it is moving in the corresponding player's direction and the light for LD14 will go off immediately. This feature will last for eight seconds and can only be used once. For example, if Player 1 switches on SW14, the ball will decelerate as it moves towards the green pedal for up to eight seconds or vice versa.</p> <p>Ball Magnet: At any time during the game, when SW13 on either of the boards is switched on, the ball will be attracted to the corresponding pedal along the y-axis of the OLED display by shortening the distance between their y-coordinates, and the light for LD13 will go off immediately. The ball will continue moving along the same y-coordinate towards the pedal if the y-coordinate of the pedal's centre is the same. This feature will last for eight seconds and can only be used once. For example, if Player 1 switches on SW13, the ball will be attracted to the green pedal as it moves towards the green pedal for up to eight seconds or vice versa.</p>	
Student C: How Yong Yang "Pedal and Scoring"	<p>Pedal Movement and Enlargement: The green pedal represents Player 1 and will be controlled by pressing BTNU (to move upwards) and BTND (to move downwards) on the main board. In contrast, the red pedal represents Player 2 and will be controlled using BTNU (to move upwards) and BTND (to move downwards) on the second board. To enable the pedal movement of Player 2, SW1 on the second board must be switched on. Both green and red pedals can never move beyond the edge of the top and bottom white borders, within which the ball is moving, on the OLED display.</p> <p>At any time during the game, when SW15 on either of the boards is switched on, the corresponding pedal will be enlarged and the light for LD15 will turn off immediately. This feature will last for eight seconds and can only be used once. For example, if SW15 on the main board is turned on, the green pedal will be enlarged for only eight seconds or vice versa.</p> <p>Score Update: Whenever the ball collides with the left or white borders of the OLED display, there will be a winner. For example, if the ball collides with the white border on the left, Player 2 wins. AN0 on the 7-segment display will show the score of Player 2; AN3 shows that of Player 1. A loop running on AN1 means Player 2 was the winner in the last round; a loop running on AN2 means Player 1 was the winner in the last round. There can only be one loop on either AN1 or AN2 running at any instance. The 7-segment display on the second board will still show "PONG" as the first board's 7-segment shows the changing scores, which will start recording when BTNC is pressed for the game to start.</p>	 <p>The green pedal's movement is controlled by pressing BTNU or BTND on the main board.</p>  <p>The pedals can never go beyond the white borders.</p>  <p>The green pedal enlarges when SW15 on the first board is switched on and LD15's light goes off.</p>  <p>The 7-segment display shows the score for Player 1 (AN3) and Player 2 (AN0), while the running loop on AN1 or AN2 indicates the winner of the last round.</p>