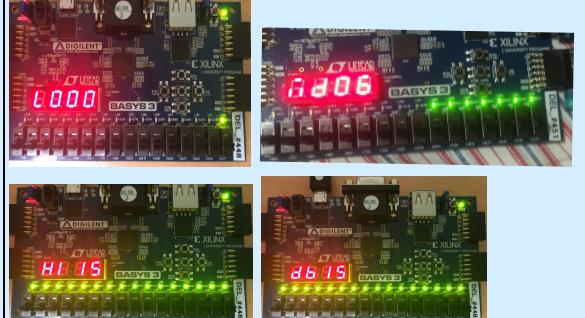
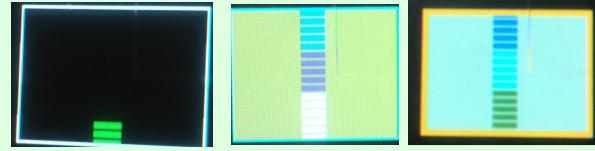
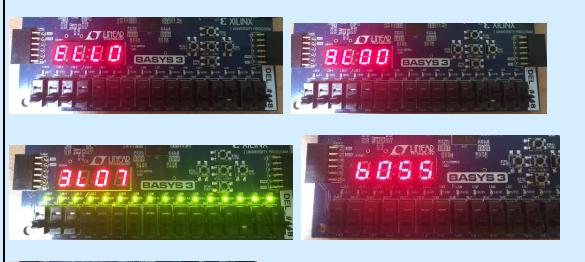


Feature	Feature Marks For	Input Devices	Feature Description	Images / Photos
Real-time audio volume indicator	Theodore		<p>LED bars will be lit according to the input to the mic - higher mic input results in more LED's being lit.</p> <p>The 7 seg disp will display the numerical level of the audio input received which also corresponds to the number of LED's currently lit</p> <p>Based on the peak level recorded, the descriptive level of the audio received will also be displayed on the 7 seg - HI representing large values, MD representing medium values and LO representing LOW values, this will alternate with the unit used to represent sound which is db.</p>	
Graphical visualisations and configurations	Abner	SW15 to SW11 and SW9	<p>SW15, SW14: 1 pixel thick border if SW15 is ON and 3 pixel thick border if SW14 is ON, SW14 overrides SW15.</p> <p>SW13: SW13 toggles volume bar</p> <p>SW12, SW11: Switches Color themes of background border and volume bar, SW11 overrides SW12. 3 Themes to choose from</p> <p>SW9: Freezes the current oled display. only in this mode.</p> <p>The volume bar shows more bars the louder the input to the mic.</p>	
Guess the Number!	Theodore	SW1, BTNU, BTND, BTNC, BTNL, BTNR	<p>SW1 when switched on will trigger the trailing 7-seg Display</p> <p>SW1 when switched off will trigger the first letter of the trailing 7-seg Display - H</p> <p>A random 2-digit number will be generated for you to guess. Concurrently, there will be a trailing welcome display on the seven seg. After it ends, there will be an input screen where you need to input the 2 digit number you think is the answer and press the centre button to confirm it. The 7 seg display will also show the number of lives you have remaining, which is set at a maximum of 9. If you need help and the mic input is high enough, the ones digit of the number will be displayed for a limited time which is dependent on the max volume level of the sound emitted. Use BTNU, BTND, BTNL, BTNR, to configure the number you wish to guess, and confirm your result by pressing BTNC. If your answer is correct, the seven seg displays PASS, else after 9 tries it will display FAIL followed by the original number generated.</p>	
Whacko	Theodore	SW2, BTNC	<p>SW2 when switched on will trigger the trailing 7-seg Display</p> <p>SW2 when switched off will trigger the first letter of the trailing 7-seg Display - H</p> <p>There will be a trailing hello display on the seven seg. After it ends, the seven seg will display the number of lives as well as the current score. All the LED displays will blink at random intervals. If the player presses the button while the LED is on, the score will increase by 1, else if he misses the lives will decrease by 1. If the mic input is high enough, the blinks will occur at a smaller frequency whose scale is based on the max volume of the mic in value. After 9 lives are up, the game will end by displaying LOSE, else if the score hits 50, the game will end by displaying BOSS, indicating that the player has won the game.</p>	
Knight Run	Abner	BTNU, BTND, BTNC	<p>An ogre is chasing you! Dodge his attacks until you reach safety. BTNU to jump</p> <p>BTND to vanish, BTNC to restart. You only have one life, a victory screen shows when the led timer runs out and getting hit will show a defeat screen. The ogre ground and the knight are all animated. The ogre has states, run/laser eyes/ground stomp while the playing has run/jump/vanish. The ground they are running in is also moving. Randomly generated attack sequence to keep you on your toes. Each entity is a separate sprite animated independently. And a FSMs are used to control logic of entities</p>	

Runman	Team	SW3, BTNU, BTND BTNU, BTNC, BTNL, BTNR	<p>SW3 when switched on will trigger the trailing 7-seg Display SW3 when switched off will trigger the first letter of the trailing 7-seg D - P</p> <p>There will be a trailing hello display on the seven seg and a prompt for player 1 . After it ends, there will be an input screen where player 1 will use BTNU BTND, BTNL, BTNR to determine a 4-letter word he wants player 2 to guess. After player1 has confirmed the word by pressing BTNC, the seven seg will prompt player2 to guess the word.The number of lives available depends on the mic level right as the first player presses btnC to confirm the first word, ranging from 5 to 15. Player2 should use BTNU BTND, BTNL, BTNR to determine the word he intends to guess and confirm it by pressing BTNC. If the word is correct, a BOOM display will be shown indicating successful completion by player 2, else if nothing happens after the set number of tries, then the BAIL display will be shown on the seven seg, indicating that player2 has failed the game. If a letter guessed is correctly all position with the correct will be locked from changing</p>	
Tic Tac Toe	Team	BTNU,BTND, BTNL, BTNR, BTNC	<p>A two player game where to win you need to get three in a row of your shape. BTNU BTND BTNL BTNR to move the selection box around the grid. The selection box cannot go over the border of the screen(e.g. BTNU at the top row does not loop it to the bottom). The selection box glows in RGB and the device will detect winning moves, the winning row/col/diagonal will breathe in brightness. Ties will not trigger the breathing effect. BTNC restarts a game after a tie/win.</p>	
Main menu	Team	BTNC, BTNU, BTND, BTNR	<p>Go to every other mode: TICTACTOE / Whacko / Random number/Hangman/General ("Real-time audio volume indicator" and "Graphical visualisations and configurations")/ Virus/ Knight Run.</p> <p>Controls : BTNU and BTND to cycle through the list normally. Blowing into the mic will cause the selection to accelerate through all the options before slowing down and coming to a stop at a random selection. One can select while it is still rolling. BTNC to confirm selection. BTNR + BTNU to return to the main menu from any mode after selection. Background for aesthetics. ** note going to "General" with sw9 on will freeze the screen making it seem like nothing happened. so sw9 off before going to general</p>	

Feedback

During this project, we liked the fact that we were able to explore more devices to program with rather than just mainly programming the common features of the main basys 3 board. Programming the microphone and oled indeed forced us to think out of the box to make their integration with our intended programs meaningful and engaging.

However, we did not like the fact that the microphone was rather unresponsive at times, which led us to believe at times that our peak finding algorithm was correct but was actually ineffective. As a result, we ended up spending a lot of time fixing the peak finding algorithm which left us with little time to explore other modifications to the system.

We feel that both members should be given an OLED display each. It is rather difficult to coordinate codes related to the OLED display since only 1 member has the display and the other member without the display has to repeatedly transfer over the codes to his teammate in order to test this code when they have not met up.

Leaving improvements open to the student's discretion was fun and we learnt a lot. Although we feel that we should have a stronger technical base as some ideas we came up with were very difficult to implement without prior knowledge and while we were just introduced our first HDL.