



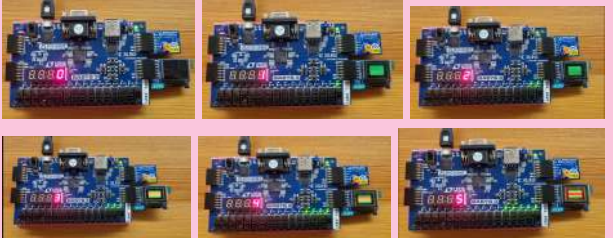





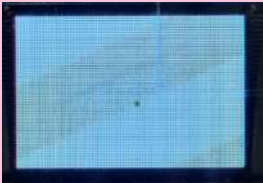





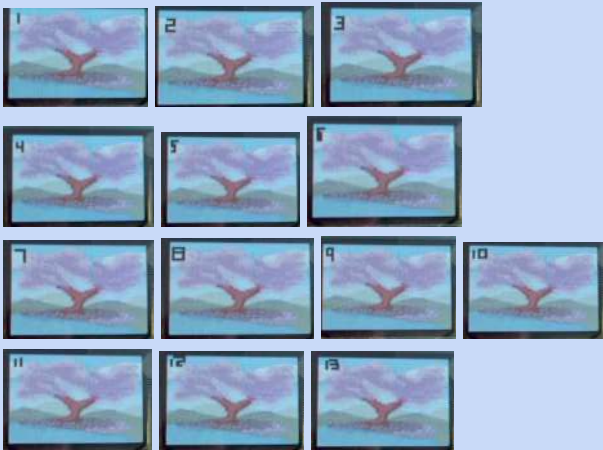

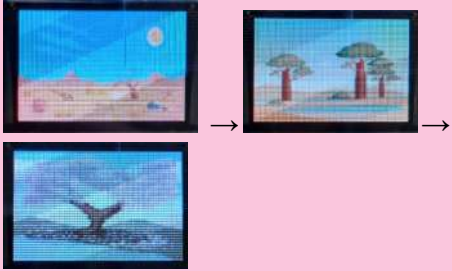


User Guide

Brief Feature Name	Feature Description	Images/Photos
Student A: Ong Zhi Hong OLED Task A Borders	SW[11] & SW[12] = 1: Show borders SW[12] = 1: Hide borders	  Show borders Hide Borders
Student B: Alfred Leong OLED Task B Bars	SW[10] & SW[11] & SW[12] = 1: Show bars SW[9] & SW[10] & SW[11] & SW[12] = 1: Hide orange bar	  Show bars Hide orange bar
Team Audio Volume Indicator	SW[0] & SW[12] = 1: AVI mode	
Student B: Alfred Leong Main Menu	Main Menu is displayed after programming device, where the Star represents user's current selection. btnU: moves Star up, capped at Draw option btnD: moves Star down, capped at Speed selection When user moves Star to Speed selection option, btnL and btnR can be used to move left or right respectively to select 1 out of 3 Watch speeds: 0.5x, 1x or 2x speed. There is no right/left limit if btnL or btnR is held down. When user moves Star to Draw or Watch option, SW[14] = 1: Enters selected option	  Draw option Watch option    0.5x speed 1x speed 2x speed
Team Draw Mode	Neon green cursor represents current location btnU, btnD, btnL, btnR: Used to move cursor up, down, left and right respectively When only SW[14] = 1 (to enter Draw mode), user is in Move state ie. moves cursor around, but nothing will be drawn on the screen SW[2] & SW[14] = 1: Continuous Draw state ie. selected colour will be displayed along the cursor's path while moving cursor around SW[3] & SW[14] = 1: One Pixel Draw state ie. when btnC is pressed, selected colour will be displayed at cursor's location SW[1] & SW[2] & SW[14] = 1: Erase state ie. colour will be erased along the cursor's path, returning to white colour SW[14] & SW[15] = 1: Clears screen of all colours, displays a white screen Default white background can also be replaced by 3 custom backgrounds with these steps. 1. X & SW[14] & SW[15] = 1 2. Switch off SW[15] 3. Switch off X X = SW[6] & ~SW[7]: Desert X = ~SW[6] & SW[7]: Oasis X = SW[6] & SW[7]: Sakura Tree	  Start/Clear Screen Continuous Draw state   One Pixel Draw state Erase State  Drawing with custom background

<p>Student B: Alfred Leong</p> <p>Colour Menu in Draw Mode</p>	<p>While in Draw Mode, SW[13] & SW[14] = 1: Display Colour Menu btnL and btnR can be used to move to select 1 out of 13 colours, capped at the most left and right. Selected colour is indicated by a red border. When SW[13] is turned off, the user can start to draw using the selected colour.</p>	 <p>Navigating colour menu with btnL and btnR</p>
<p>Student A: Ong Zhi Hong</p> <p>Image Saving and Compression</p>	<p>While in Draw Mode, SW[4] & SW[14] = 1: Compress and save current screen as a frame SW[5] & SW[14] = 1: Delete most recent frame</p> <p>Using BRAM for 7.25 frames worth of memory, the module can store 13 frames of memory in bad cases where the frames are rather detailed with adjacent pixels having different colours very often (tested with sakura tree).</p> <p>For simpler drawings with just our provided colour palette, much more frames can be stored.</p>	
<p>Student A: Ong Zhi Hong</p> <p>Watch Mode (Reconstruct saved frames)</p>	<p>After selecting desired Watch speed, move to the Watch option in the Main menu and turn on SW[14] to enter Watch Mode. Saved frames will start to play repeatedly from frame 1 to frame n based on the selected speed, where n = number of saved frames. Selected speed of 0.5x has an interval of 0.25s, 1x has an interval of 0.5s and 2x has an interval of 1s per frame.</p>	 <p>Watching frame 1 to frame n, where n = 4</p>
<p>Team</p> <p>Noise Detector of Area over time</p>	<p>Detects if an environment is noisy or not by displaying preset images. The order of display is Desert → Oasis → Sakura Tree. For every X seconds that passes, if input mic volume has not gone above the next level's threshold value, the OLED screen will change display. If input mic volume goes above the threshold value of current level at any point, display will go back by one level ie. Oasis → Desert. The deeper the level, the lower the threshold value ie. Sakura Tree has the lowest threshold value. SW[0] & ~SW[1] = 1: X = 3600 SW[0] & SW[1] = 1: X = 10</p>	 <p>Watching Desert → Oasis → Sakura Tree</p>

- Feedback:
1. The project, whilst a team project, forces us to have individual components which sort of defeats the purpose of the project being a group work. Many past projects shown to us tend to have each individual doing their own separate game and the pair does another separate game with little correlation. We wanted to avoid this and hence we broke down a drawing app into parts that we can individually work on and parts we can work on together as a team. However, we feel that it is best to just count everything as team effort.
 2. Overall, the project was challenging and fun but I think marks distribution can be better communicated by having a document instead of through word of mouth so we know the effort to put into each part.