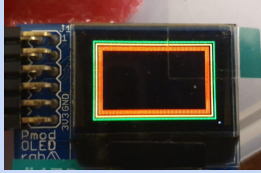
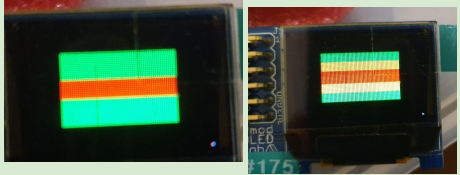
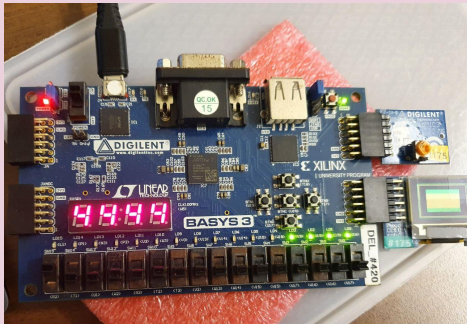

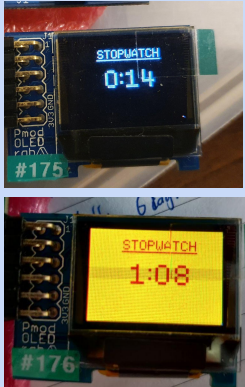
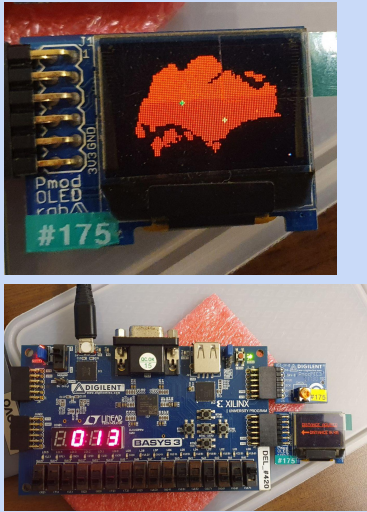
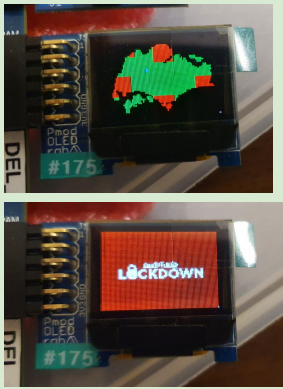
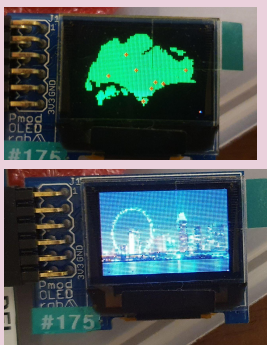


Lab session: Thursday A.M (S1\_02)

Student A: Chien Jing Wei

Student B: Karthikeyan Vigneshram (A0230109W)

Feature	Feature Description	Images
Student A: Chien Jing Wei Oled Task A Borders + AVI2A	1) PBD & PBU: Navigate the menu to lab task option 2) PBC: Enter lab task function 3) SW[0] = 1 : Borders shown 4) SW[0] = 0 : Borders hidden 5) SW[14] = 1 for 2s: Return to main menu.	
Student B: Karthikeyan Vigneshram Oled Task B	1) Press PBD to navigate the menu to lab_task 2) Press PBC once lab task is reached 3) Turn on SW1 to see Oled task B 4) Turn on SW2 to hide the Orange bar and turn it off to show the Orange bar 5) Switch on SW14 for 2 seconds and turn it off again to return to the main menu.	
Team: Audio Volume Indicator	1) PBD & PBU: Navigate the menu to lab task option 2) PBC: Enter lab task function 3) SW[3] = 1 : Sound calibration - When a single bar is displayed on the 7 segment display, leave the FPGA alone to record ambient noise. - When double bars are displayed, immediately emit a loud sound from your phone near the mic to record max volume. 4) Switch on and off SW[14] quickly to redo calibration 5) SW[3] = 0 & SW[15] = 1: Display volume indicator 6) SW[14] = 1 for 2s: Return to main menu.	
Student A: Chien Jing Wei Main menu	1) Once the FPGA is programmed, the menu page will be displayed on the OLED. 2) PBD & PBU: Navigate the menu 3) PBC: Enter the selected function 4) SW[0] = 0 or 1 : Invert menu colours!	
Student A: Chien Jing Wei Stopwatch	1) PBD & PBU: Navigate the menu to stopwatch 2) PBC: Enter stopwatch function 3) SW[0] = 1, SW[1] = 0: Start the stopwatch 4) SW[0] = 0: Start the stopwatch 5) SW[1] = 1: Reset the stopwatch 6) SW[2/3/4] = 1 : Change stopwatch colour 7) SW[14] = 1 for 2s: Return to main menu.  Note: Stopwatch continues even if you leave the function!	

<p>Student A: Chien Jing Wei</p> <p>Distance Finder</p>	<ol style="list-style-type: none"> <li>1) PBD &amp; PBU: Navigate the menu to distance finder option</li> <li>2) PBC : Enter distance finder function</li> <li>3) SW[0] = 0 : Precise cursor movement.</li> <li>4) SW[0] = 1 : Fast cursor movement.</li> <li>5) PBL, PBU, PBR, PBL : Move cursor.</li> <li>6) PBC: lock cursor.</li> </ol> <p>Note: repeat step 5 and 6 for second cursor</p> <ol style="list-style-type: none"> <li>7) PBC : Display the distance between the 2 points on the 7 segment display</li> <li>8) PBC : Return to the map, replot 2 cursors</li> <li>9) SW[1] = 1 : Display Singapore flag!</li> <li>10) SW[14] = 1 for 2s: Return to main menu.</li> </ol> <p>Note: If you plotted the cursor wrongly, toggle SW[14] quickly to reset the cursors and replot the cursor positions.</p>	
<p>Student B: Trace together</p>	<ol style="list-style-type: none"> <li>1) Use PBU AND PBD to navigate the menu and use PBC to select the Trace together option</li> <li>2) Switch on SW0 to move the cursor around</li> <li>3) Press PBC to select an area of hotspot</li> <li>4) Immediately, use the mic_in to increase the size of the red hotspot</li> <li>5) Once the area of hotspots combined exceeds roughly half of the area of the Singapore map, the Oled display shows that lockdown should be put in place</li> <li>6) Turn on SW14 for 2 seconds and turn it off again to return to the main menu.</li> </ol>	
<p>Team: Landmarks</p>	<ol style="list-style-type: none"> <li>1) PBU &amp; PBD: Navigate the menu to Landmarks option</li> <li>2) PBC : Enter Landmarks function</li> <li>3) PBU, PBD, PBL and PBR: Navigate to the different landmarks</li> <li>4) PBC : Display landmark on Oled screen</li> <li>5) PBC: Return to the map with landmarks</li> <li>6) Turn on SW14 for 2 seconds and turn it off again to return to the main menu.</li> </ol>	

### Feedback:

- Learnt a lot about verilog from this project
- There is a steep learning curve and little guidance for more complex implementations

### References:

- <https://github.com/nus-wira/EE2026-FPGA-Project>
- <https://verilogcodes.blogspot.com/2020/12/synthesizable-clocked-square-root.html>
- [https://www.youtube.com/watch?v=v2CM8RaEeQU&t=382s&ab\\_channel=SimplyEmbedded](https://www.youtube.com/watch?v=v2CM8RaEeQU&t=382s&ab_channel=SimplyEmbedded)