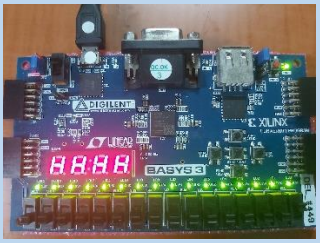
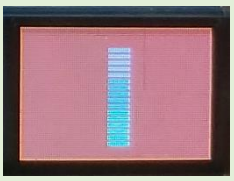
Student A: See Jian Hui (A0217701N)

Student B: Roycius Lim Yuanwei (A0218024R)

Official Lab Session: Thursday A.M.

Group ID: S5_18

| Feature | Feature Marks For | Input Devices | Feature/Description | Images/Photos |
|---|---|---|---|---|
| Real-time audio volume indicator | See Jian Hui | SW0, SW1 | **SW0 is 0:** LEDs display the 12 bit mic_in signal<br>**SW0 is 1:** LEDs display the peak intensity (volume) of the audio signal (mic_in)<br>**SW1 is 0:** Seven segment display shows the peak intensity of the audio signals represented by L (low), M (medium) and H (high)<br>**SW1 is 1:** Seven segment display shows the peak intensity of the audio signals represented by decimal numbers from 00 to 15. |  <br>  |
| Graphical visualisations and configurations | Roycius Lim Yuanwei | BTNL, BTNC, BTNR, SW12, SW13, SW14, SW15 | **SW15 is 0**: Border is invisible<br>**SW15 is 1**: Border is visible<br>**SW14 is 0**: 1-pixel wide border<br>**SW14 is 1**: 3-pixel wide border<br>**SW13 is 0**: Volume Bar is invisible<br>**SW13 is 1**: Volume Bar is visible<br>**SW12 is 0**: Default Colour Scheme<br>**SW12 is 1**: Alternate Colour Scheme<br>**BTNL is pressed**: Volume bar shifts left<br>**BTNR is pressed**: Volume bar shifts right<br><br>Displays a volume bar with levels from 0 to 15 depending on the current sound level being input to the mic. Only runs when “Obstacle Dodging Game” is disabled. Volume bar shifting is disabled while “Fidget Clicker” is enabled. |  <br>  <br>  |
| Obstacle Dodging Game | Roycius Lim Yuanwei | BTNU, BTNC, BTND, SW10 | **SW10 is 0**: Game is disable/paused<br>**SW10 is 1**: Game is enabled<br>**BTNU is pressed**: Move player position up once<br>**BTND is pressed**: Move player position down once<br>**BTNC is pressed**: Reset game<br><br>Obstacles spawn depending on the noise level. Use PBU and PBD to navigate the player to avoid obstacles. If player gets hit by obstacle the player dies and the game stops. Player appears green while alive and red when dead. Press PBC to start a new game or reset. |  <br>  |

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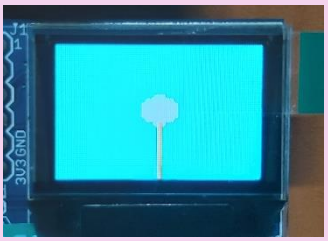
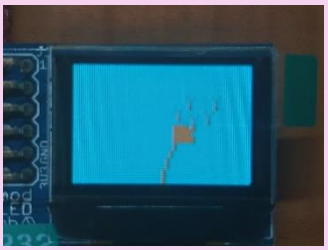
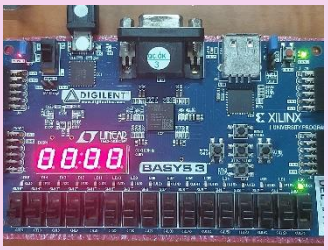
| Dandelion OLED Display | Team | SW9 | **SW9 is 0**: Feature is Disabled<br>**SW9 is 1**: Feature is Enabled<br><br>While you blow into the microphone (or volume is high), the dandelion will scatter, otherwise it will be full. Only runs when “Obstacle Dodging Game” is disabled. |  <br>  |
| Longest Breath Game | Team | SW11 | **SW11 is 0**: Game is disabled<br>**SW11 is 1**: Game is enabled (SW10 has to be off)<br>**BTNC is pressed**: Clear score and set game back to “ready” state<br><br>7 segment display shows the current score. To start, blow into the microphone. Score starts counting when game starts. The moment the mic input goes below a certain level, the score stops adding and the game ends. Press BTNC to clear the score and start a new round. “Obstacle Dodging Game” and “Fidget Clicker” must be disabled for this for this game to run. |  <br>  |
| Fidget Clicker | See Jian Hui | SW0, SW2, PBU, PBC | **SW2 is 0:** Fidget Clicker is disabled<br>**SW0 is 1 & SW2 is 1:** Fidget Clicker is enabled<br>**BTNC is pressed:** Bit shift the LEDs that are already light up to the left<br>**BTNU is pressed:** Resets the LEDs back to starting position<br><br>7 segment display shows “CLIK” when LED lights are still visible on the board. When the LED lights are no longer visible on the board, the 7 segment display shows “rSEt” to prompt user to reset the position of LED lights. This can be done by pressing BTNU. |  <br>  |

Feedback:
Throughout this project, we were able to use what we learnt over the semester and come up with creative Implementations of features on the Basys3 FPGA board. As we were given a chance to design a user-friendly entertainment system, a lot of thought went into thinking from users’ perspective for implementation. This project gave us an experience of how to work with one another which is similar to the working environment that we will face in future. Overall, the project gave us a large amount of hands-on experience to code in Verilog and program the Basys3 using Vivado.

References:
Ideas were discussed within the team and no external references were used.