

## EE2026 Project Report

## Group S2\_05

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PERSONAL AND TEAM IMPROVEMENTS		
Student / Improvement Name	Description	Images / Photos
Team / Sleep	<p>The project is designed to promote healthy sleep habits by assisting the user throughout their sleep journey, from the moment they decide to go to bed until they wake up.</p> <p><b>Main Menu:</b></p> <ul style="list-style-type: none"> <li>- To select a game or function, press "btnC." To return to the main menu, press "btnC" again.</li> <li>- Navigate through the menu options by pressing the "btnL" or "btnR" button to move to the next game or function.</li> <li>- To reset a game, press "btnD."</li> </ul> <p><b>Features and Functions</b></p> <ol style="list-style-type: none"> <li>1. Determine if the environment is suitable for sleep</li> <li>2. Play a game to unwind before sleeping</li> <li>3. Set an alarm that rings</li> <li>4. Unlock the system with a password to wake up properly</li> </ol> <p>The overall group improvement is the menu selection. We have improved the user experience by enhancing the menu selection for choosing different games and features.</p>	
James / Quiet Time	<p>This module will indicate if the environment is appropriate for sleeping by measuring the ambient noise and light.</p> <p>The <b>OLED Display</b> will change dynamically relative to this. At a quiet level, the avatar will be sleeping soundly, snoring with Zs. When it is noisy, music notes will move across the screen, <b>with more music notes the noisier the environment is, and the man will angrily fly off his bed</b>. When bright, the <b>window</b> will show that it is <b>daytime</b>, and night otherwise.</p> <p>The <b>seven segment display</b> will also show the noise level on a scale of 1 to 9. (Blank if silent, H if greater than 9)</p> <p>The <b>LEDs</b> will also show the light level detected by the <b>LDR module</b> connected to <b>JXADC[0]</b> and <b>JXADC (GROUND)</b></p>	 <p>Quiet: Zs / Noisy: Music Notes, Angry man</p> <p>Dark: Night Time / Bright: Day Time</p>  <p>7 Segment display showing noise level, LEDs showing light level</p>
Azfarul Matin / Sheep-Jumping Game	<p>This module implements a dynamic sheep-jumping game with graphics of a sheep character's lateral movements within the screen, set against a background featuring grass, fence, and sun.</p> <p>The <b>OLED display</b> provides real-time updates, responding to the sheep's precise position and environment, which runs at <b>5k Hz</b>.</p> <p>The game controls are facilitated by the <b>left mouse button</b>, which triggers an immediate change in the sheep's y-axis position.</p> <p>A <b>seven-segment display</b> conveys the number of sheep left to clear. Only "<b>an[0]</b>" is being used. Initially, it displays the digit "9," representing the initial count of nine sheep to be counted before</p>	 <p>7 segment display shows how many sheep left to count.</p>  <p>Sheep jumps when left mouse is clicked</p>

	<p>the player can go to sleep. If the sheep successfully clears the fence, this display shifts to show the reduced count, all the way to 0.</p>	
Barbara Chong/ Timer and alarm	<p>When the user presses “<b>btnU</b>”, the program initiates, and a timer starts counting upwards, displaying the count on the seven-segment display. This display consists of four anodes: AN0 increments every 0.1 seconds, AN1 every 1 second, AN2 every 10 seconds, and AN3 every 100 seconds.</p> <p>The <b>seven segment display</b> refreshes every 4ms, enabling different values to be shown on the anode simultaneously. This design minimizes computational complexity, resulting in a more accurate clock time.</p> <p>When “<b>sw1</b>” is active, the timer halts, effectively freezing the countdown. This feature allows the user to pause the timer when necessary. When the user determines their optimal time to wake up feeling refreshed, they can activate “<b>sw0</b>” and the timer will reverse, counting down from the chosen time.</p> <p>When the timer reaches 0, it triggers an <b>alarm sequence</b>. To produce the desired sound, the timer operates with a clock signal of 7Hz, and each note in the alarm sound is generated using different frequencies, ranging from 787 Hz to 1405 Hz. <b>LED indicators</b> also light up in response to specific notes being played by the alarm. These LEDs indicate the corresponding musical notes as per the note sequence.</p>	 <p>Seven segment display before it starts</p>  <p>Seven segment display when it is counting</p>  <p>Seven segment display when it reaches 0 and the led will light up correspondingly</p>
Barbara Chong/ Spider and sleeping game	<p>At the start, the <b>OLED screen</b> will show an animation of a person peacefully sleeping. Every 3 seconds, a spider makes a surprising appearance on the screen. To engage the user in a simple and interactive game, the user can click the <b>left button of the mouse</b> to make the spider disappear. This interactive game is designed to be repetitive and soothing, helping the user relax and remain in a state of deep sleep.</p>	
Karishma Thirumaran/ Wake up call	<p>This module ends the sleep cycle, by engaging the users' senses to fully awaken them and start the day right,</p> <p>Users have to draw their password, one number at a time, on the <b>OLED screen</b>, using the <b>mouse</b>. With a left click, they can select their ink (purple paint), and hold to draw the number on the canvas. As the user draws a number, the LED corresponding to its number will light up. They can right click to reset. The password is currently set to 3-2-0-5. If the correct numbers are drawn in that specific order, it will show up on the <b>seven-segment display</b>, on each anode sequentially. Only when all the numbers have been drawn and entered successfully, will LEDs 11-15 light up, and the good morning screen will be shown.</p>	

## References

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