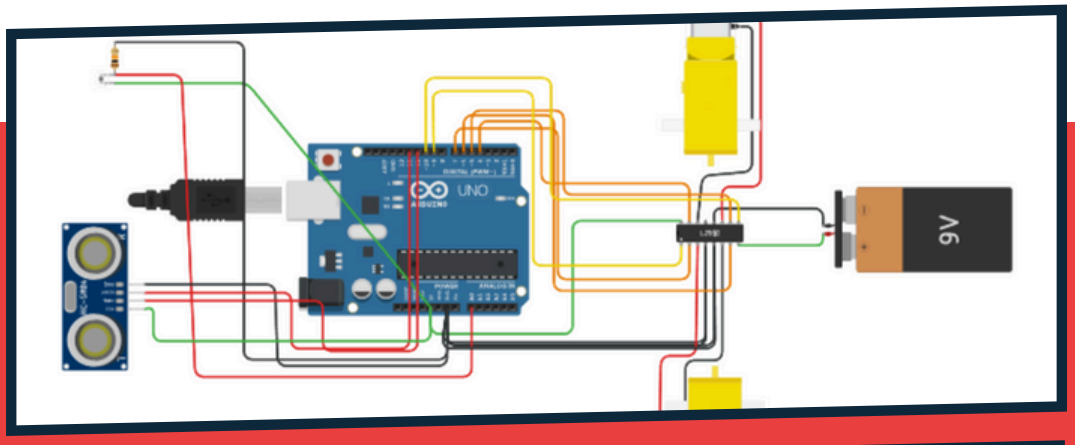
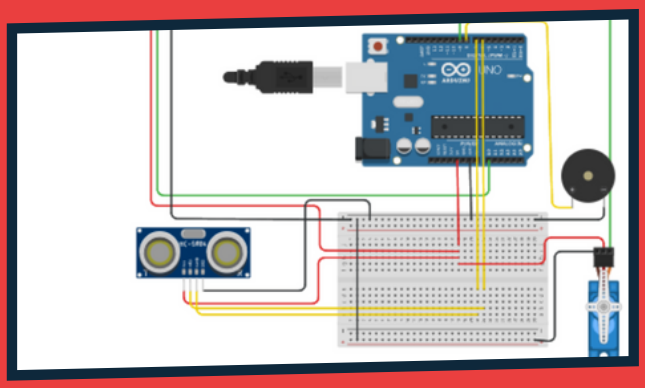
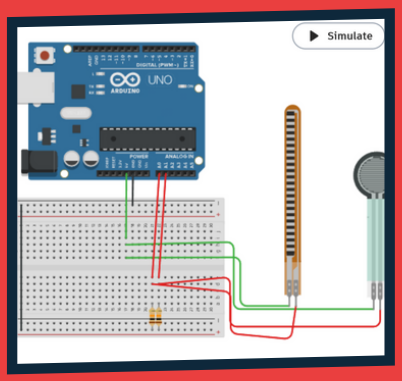
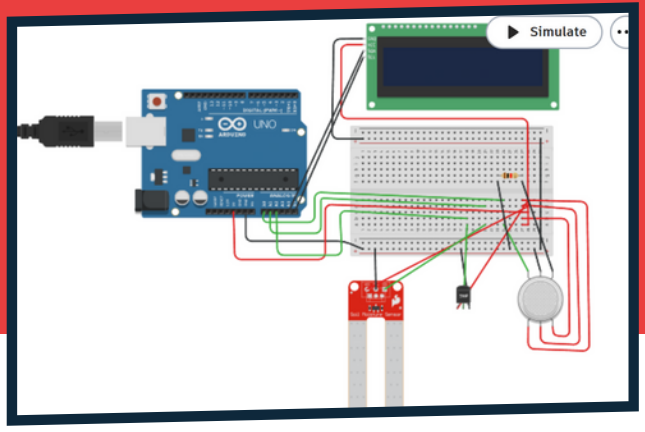
AP HAMESH
EC24B1132

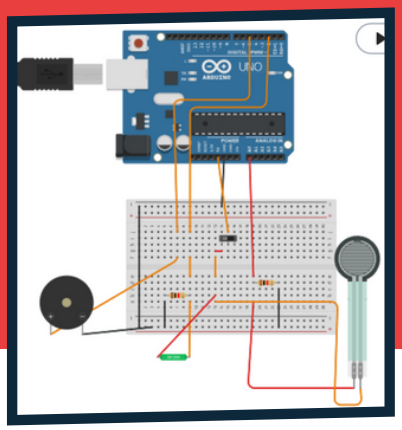
TASK #1











Projects:

1.Secret Dino Sprint

(Photoresistor, Ultrasonic distance sensor)

Usual chrome dinosaur game, however, this one is automated and informs you when others intrude.

2. Gaming Gesture Gloves

(Flex sensor, Force sensor)

A glove that allows you to slide and fire with hand motions.

3. Earthquake Detector

(tilt sensor and force sensor)

A detector that detects earthquakes in both mass and water.

4. Env Detector

(gas sensor, soil moisture sensor, temperature sensor)

A sensor that monitors the surroundings and presents the information on an LCD screen.

5.Photon Rover

(light ambient sensor, ultrasonic distance sensor)

A robot that navigates based on the intensity of light that strikes it will halt when an object is positioned in its path.

1.Secret Dino Sprint

Tired of manually jumping in the Chrome Dinosaur game? Let's add some automation! This Arduino-powered project uses a photoresistor (LDR) to detect screen brightness changes and automatically trigger a jump when an obstacle appears.

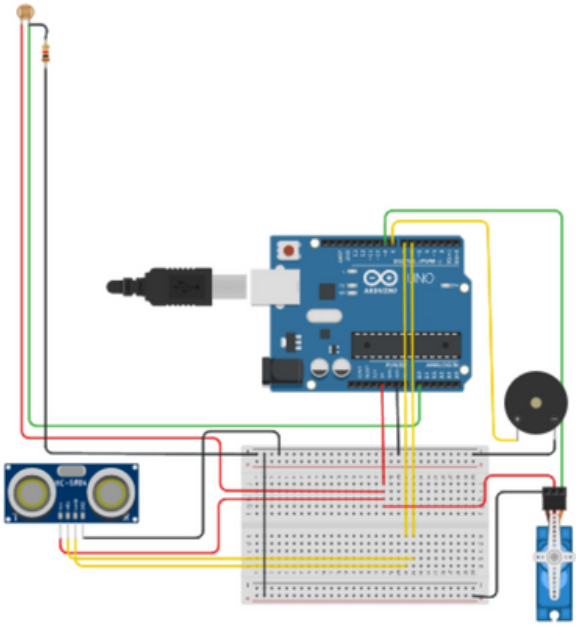
But wait—there's a twist! To keep it stealthy, we'll integrate an HC-SR04 ultrasonic sensor to detect if someone (like your boss or teacher) is approaching. If it senses movement nearby, a buzzer will sound an alert so you can quickly switch tabs before getting caught.

Components:

- Photoresistor (LDR) – Detects obstacles in the game
- Servo Motor – Simulates a jump by pressing the spacebar
- HC-SR04 Ultrasonic Sensor – Detects if someone is approaching
- Buzzer – Alerts you to switch screens
- Arduino Uno – The smart brain decoding your moves

How It Works:

1. The LDR monitors screen brightness—when an obstacle appears (cactus or bird), it triggers the servo to "jump."
2. The ultrasonic sensor constantly scans for movement near your desk.
3. If someone gets too close, the buzzer sounds a quick alert, giving you time to close the game and look busy.



Tinker Cad Link: https://www.tinkercad.com/things/7ze1AIoPAL4-secret-dino-sprint

2.Gaming Gesture Gloves

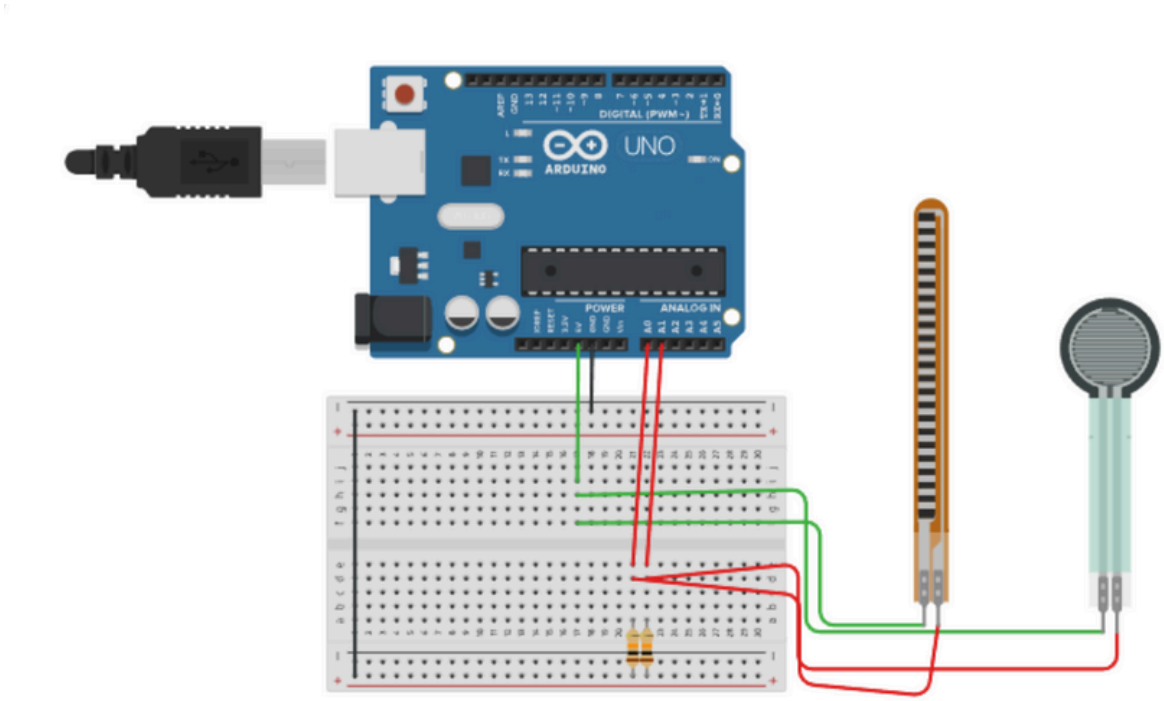
Explore the realm of adaptable technology with these gloves, your personalized gesture-driven motion and force detector! This innovative project utilizes a flex sensor to monitor hand movements and a force sensor to detect pressure or impact, transforming ordinary gestures into impactful commands—such as advancing a slide with a finger bend or alerting to a fire when pressure is sensed.

Components:

- Flex Sensor – Detects bending like a bionic finger
- Force Sensor – Senses pressure or sudden impact
- Arduino Uno – The smart brain decoding your moves

How It Works:

1. The flex sensor reads how much your finger or wrist is bent
2. The force sensor checks for pressure (like a push or tap)
3. If the flex value drops low enough → prints “Slide” 🛝
4. If the force reading spikes high → prints “Fire!” 🔥
5. Everything is shown in the Serial Monitor so you can react like a superhero in training



Tinker Cad Link: https://www.tinkercad.com/things/3TXnfPPO4b0-gaming-gesture-gloves

3.Earthquake Sensor

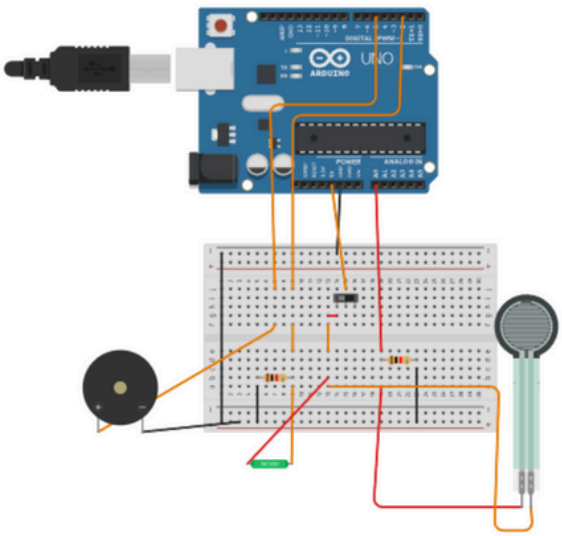
A brave little system that stands tall (and sometimes tilts) to detect earthquakes and tsunamis before they catch us off guard. Equipped with a tilt sensor to sense tremors in buildings and land, and a force sensor to feel pressure changes under water, this Arduino-based hero is designed to monitor seismic activity and pressure shifts from waves, making it a perfect warning system for both cities and coastal areas.
Whether its ground shaking or a sudden pressure surge from tsunami waves—this device feels it, logs it, and raises the alarm.

Components:

- Tilt Sensor – Detects sudden movement or angle changes in land or buildings
- Force Sensor (FSR) – Senses pressure from water waves (used to detect tsunamis)
- Arduino Uno – The core processor interpreting all the shaking and squeezing
- Buzzer – Blasts a loud warning if danger is detected
- Resistors (10KΩ) – Used for sensor voltage divider circuits

How It Works:

1. Tilt Sensor monitors vibration or angle changes—if the ground starts to shift, it's detected instantly.
2. Force Sensor measures water pressure changes—spikes in force could indicate tsunami waves.
3. If either sensor exceeds a threshold, the buzzer sounds an emergency alert and optionally flashes LEDs.
4. Readings are logged to the Serial Monitor—for scientists, safety officers, or the curious.



Tinker Cad Link: https://www.tinkercad.com/things/bX1VC1uf3QW-earthquake-sensorland-and-water

4.Env Detector

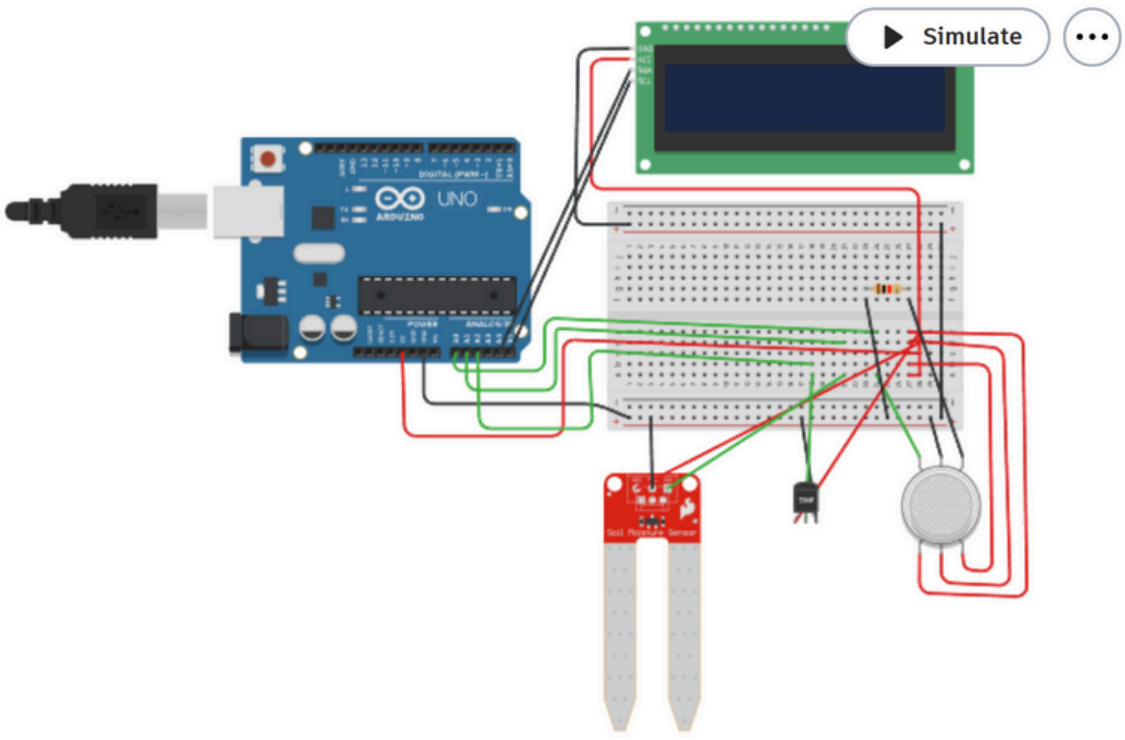
Introducing Env Detector — your personal, compact environmental investigator! Constructed with an Arduino, an LCD display, and three sophisticated sensors, Env Detector monitors air quality, soil moisture, and temperature, emulating the work of a true eco-scientist. Whether you are overseeing a greenhouse, tending to a garden, or showcasing your Arduino skills, this project emphasizes real-time data collection and environmental consciousness.

Components:

- Gas Sensor– Sniffs out air pollution or gas concentration
- Soil Moisture Sensor – Checks if your plant needs a drink
- TMP36 Temperature Sensor – Measures ambient temperature
- I2C LCD (Adafruit_LiquidCrystal) – Displays all sensor data like a pro
- Arduino Uno – The data brain

How It Works:

1. Reads gas levels from the air using the analog gas sensor
2. Measures soil moisture to see if your garden is thirsty
3. Calculates room temperature using the TMP36 sensor
4. Displays it all neatly on a 16x2 LCD screen in real time
5. Also logs data to the Serial Monitor for extra detail nerd points



Tinker Cad Link: https://www.tinkercad.com/things/h8aRQ3l2KwN-env-detector

5.Photon Rover

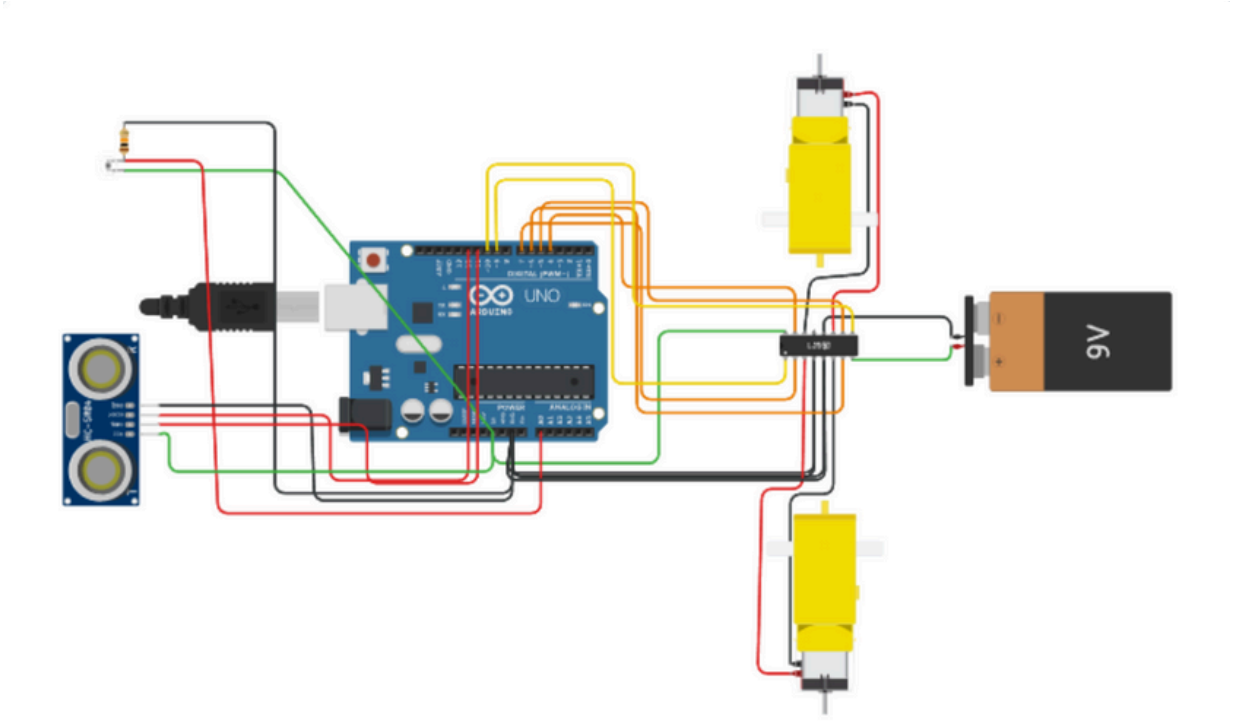
Introducing Photon Rover, your high-speed robot powered by light and equipped with obstacle detection capabilities! This innovative device accelerates in brighter conditions and decelerates in darker environments, utilizing a light-dependent resistor (LDR) for optimal performance. However, it is not merely fast; it is also intelligent. When the ultrasonic sensor identifies an obstacle, the robot comes to a complete stop to prevent any collisions.

Components:

- LDR – Measures ambient light and adjusts speed accordingly
- HC-SR04 Ultrasonic Sensor – Detects obstacles in the path
- L293D Motor Driver – Controls two DC motors like a pro
- 2 Hobby DC Motors – Drive the rover forward
- Arduino Uno – The central brain

How It Works:

1. The LDR reads ambient light—the brighter it gets, the faster the motors spin
2. The ultrasonic sensor checks if there's an obstacle in front
3. If something is within 150 cm, it instantly stops the motors to avoid collision
4. If the coast is clear, it speeds up or slows down based on the light level
5. All data is displayed live in the Serial Monitor, like a high-tech dashboard



Tinker Cad Link: https://www.tinkercad.com/things/6Whi2ZevBI2-photon-rover-light-obstacle-aware-robot

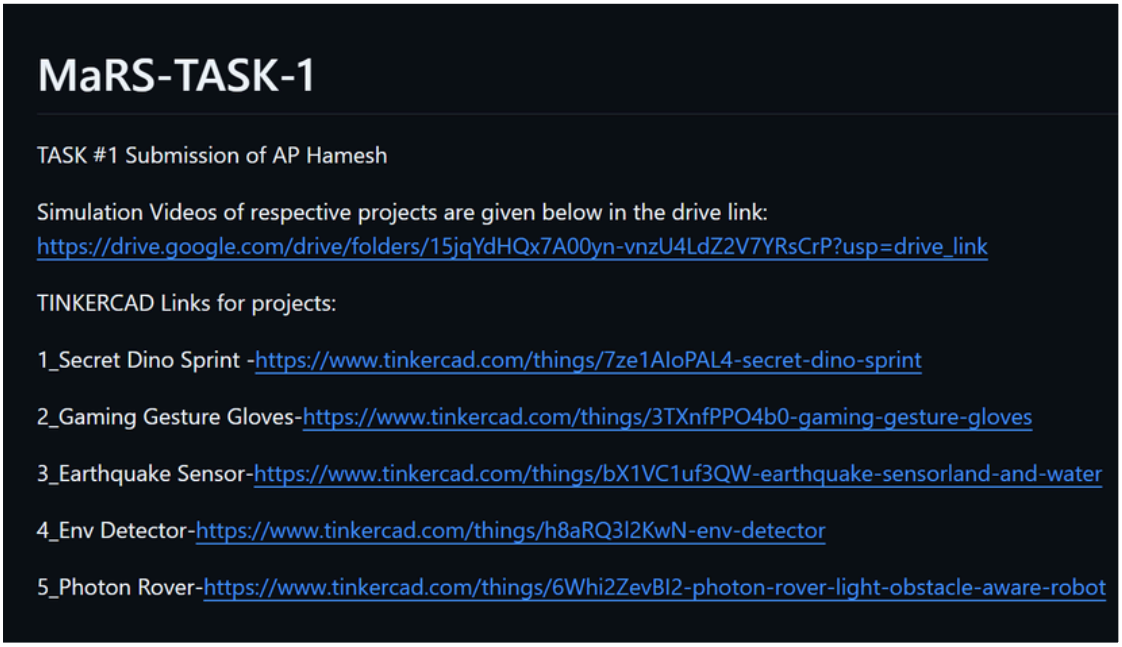
My reflections on this Task #1:

Emerging from an exhilarating five-day Techno Cultural Fest, I was immediately faced with another challenge: completing five Arduino projects in a tight timeframe. The festival had sparked my creativity but left me physically drained, with no time to rest.

Despite the exhaustion, I switched into "builder mode." Transitioning from the lively world of music and lights to the focused realm of jumper wires and serial monitors was jarring. My body craved sleep, but my mind was consumed with sensor setups and debugging code.

Each project came with its own hurdles—like the Photon Rover that wouldn't stop for obstacles or the Chrome Dino Sprinter, where the LDR malfunctioned under simulated light. There were countless late-night frustrations: incorrect connections in Tinkercad, confusing pin assignments, and puzzling serial errors. What kept me going was the vision of seeing all five projects come to life. From an earthquake and tsunami detector using tilt and force sensors to ambient light controlling motor speed, every project told a story.

This experience reminded me that engineering is more than building—it's about solving problems under pressure and learning through mistakes. Though exhausted, I completed five innovative and functional projects, proving that resilience and passion make the journey worthwhile.
Let me know if you want it more formal or more casual!



What I Gained from this Task #1:

1. Deepened understanding of sensor behavior and motor control
2. Real-world experience with debugging and simulation
3. Dealing with diverse Arduino-based systems
4. And most importantly—confidence in my ability to build under pressure

This may have been post-fest chaos, but it turned into a maker's marathon. And I'm proud of every bug squashed and every byte uploaded.

Thank you for this opportunity!

GitHub Repository Link: https://github.com/aphamesh/MaRS-TASK-1.git

Simulation Videos of the projects:
https://drive.google.com/drive/folders/15jqYdHQx7A00yn-vnzU4LdZ2V7YRsCrP?usp=drive_link