Noise Pollution Monitoring

Abstract:

Noise pollution is unwanted sound, it needs to be controlled to make the workplace comfortable. This chapter analyses noise mathematically and the effects of multiple sources are examined. Two noises of exactly the same level can have a combined noise level that is 3 dB higher than the individual values.

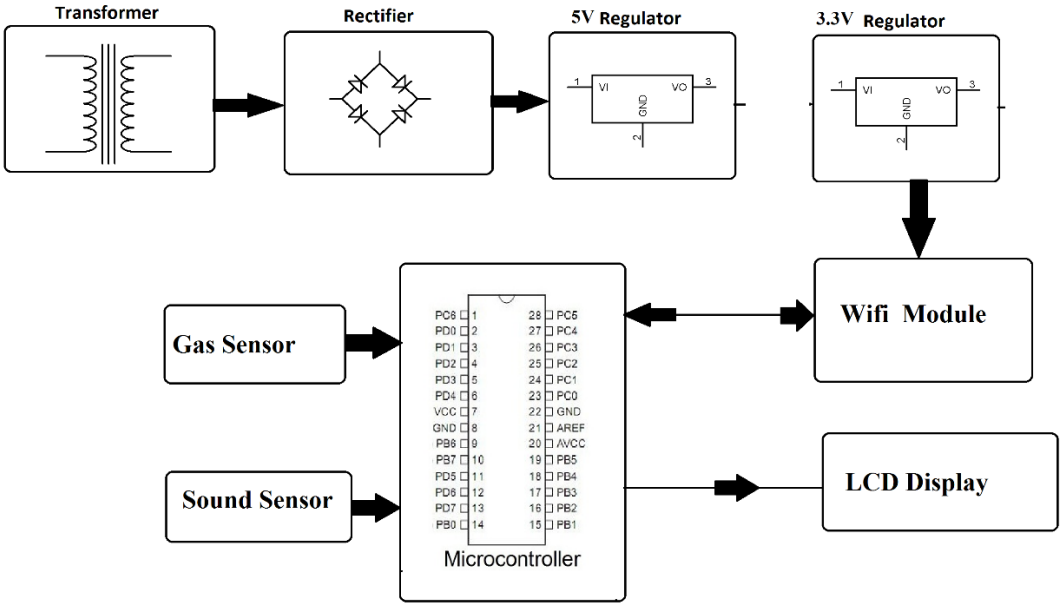
Noise or sound level monitoring or measurement is a process to measure the magnitude of Noise in industries and residential area. Data collected from Noise level monitoring & Testing helps us to understand trends and action can be taken to reduce noise pollution.

It can cause hearing loss, tinnitus, and other health problems. Noise pollution can also affect wildlife and ecosystems by disrupting communication, feeding, and breeding patterns. Noise monitoring can help to identify areas where noise levels exceed the legal limits and take measures to reduce them.

This allows authorities to monitor noise pollution in different areas and take action against it. Also authorities can keep a watch on the noise pollution near schools, hospitals and no honking areas, and if system detects air quality and noise issues it alerts authorities so they can take measures to control the issue.

Building Of Noise Pollution Monitoring:

System uses noise sensors to sense presence of harmful gases/compounds in the air and constantly transmit this data to microcontroller. Also system keeps measuring sound level and reports it to the online server over IOT. The sensors interact with microcontroller which processes this data and transmits it over.



Hardware Specifications

- Atmega Microcontroller
- MQ 135 Sensor
- Mic Sensor
- ESP8266 Wifi Module
- LCD Display
- Crystal Oscillator
- Resistors
- Capacitors
- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED
- Transformer/Adapter
- Push Buttons
- Switch
- IC
- IC Sockets

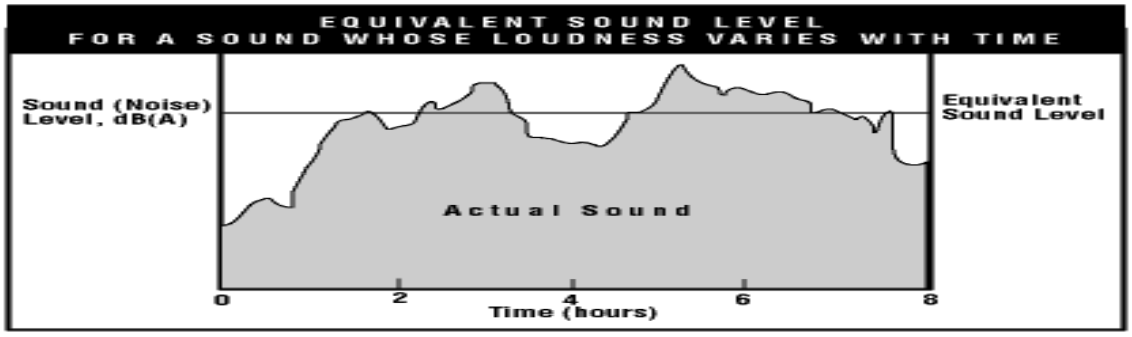
Software Specifications

- Arduino Compiler
- MC Programming Language: C
- IOTGecko

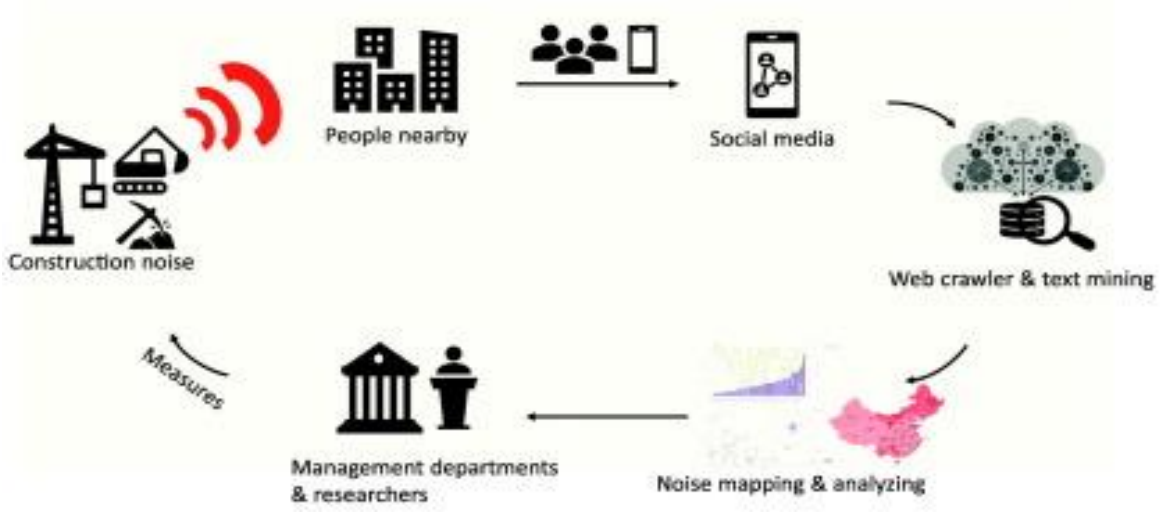
Public Area Measurement:

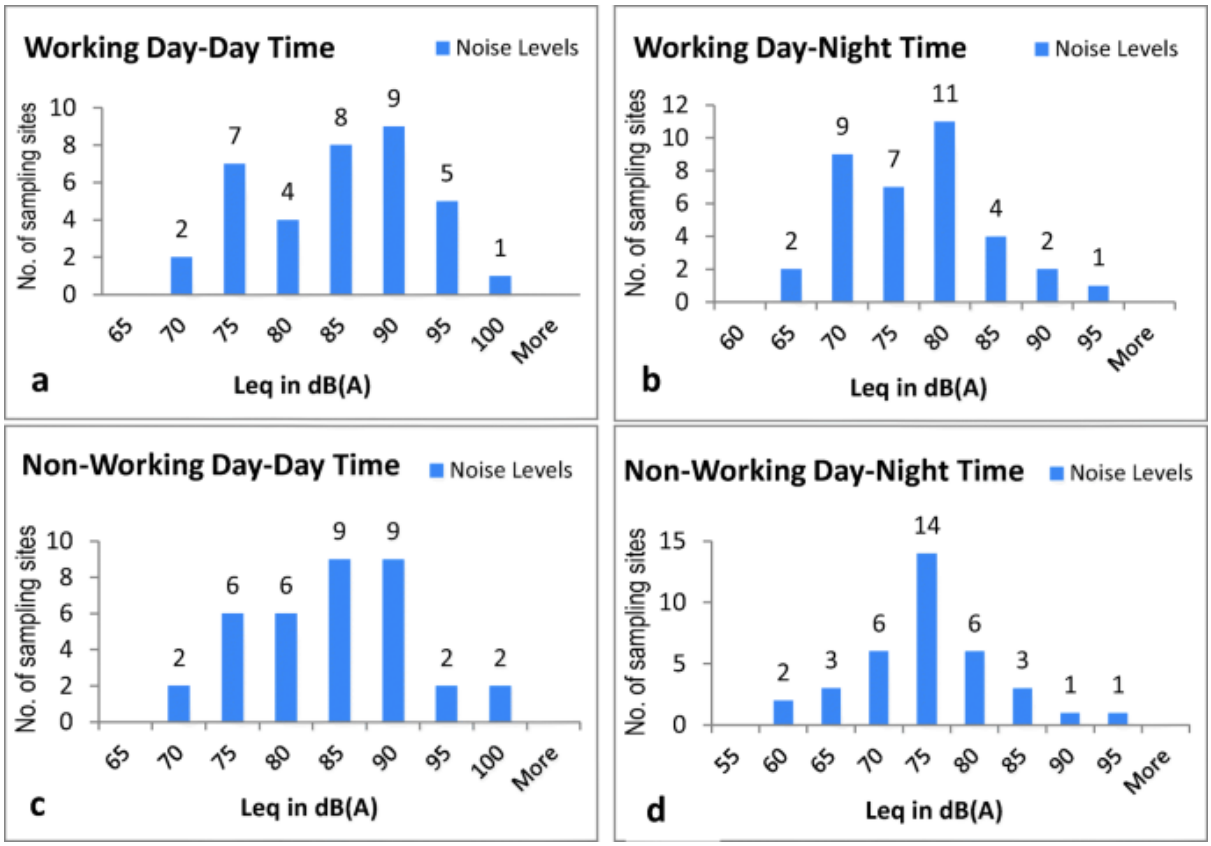
Noise or sound level monitoring or measurement is a process to measure the magnitude of Noise in industries and residential area. Data collected from Noise level monitoring & Testing helps us to understand trends and action can be taken to reduce noise pollution.

The most common instruments used for measuring noise are the sound level meter (SLM), the integrating sound level meter (ISLM), and the noise dosimeter. It is important that you understand the calibration, operation and reading the instrument you use.



Decibel (dB) is the main unit used to measure the intensity or loudness of sounds.

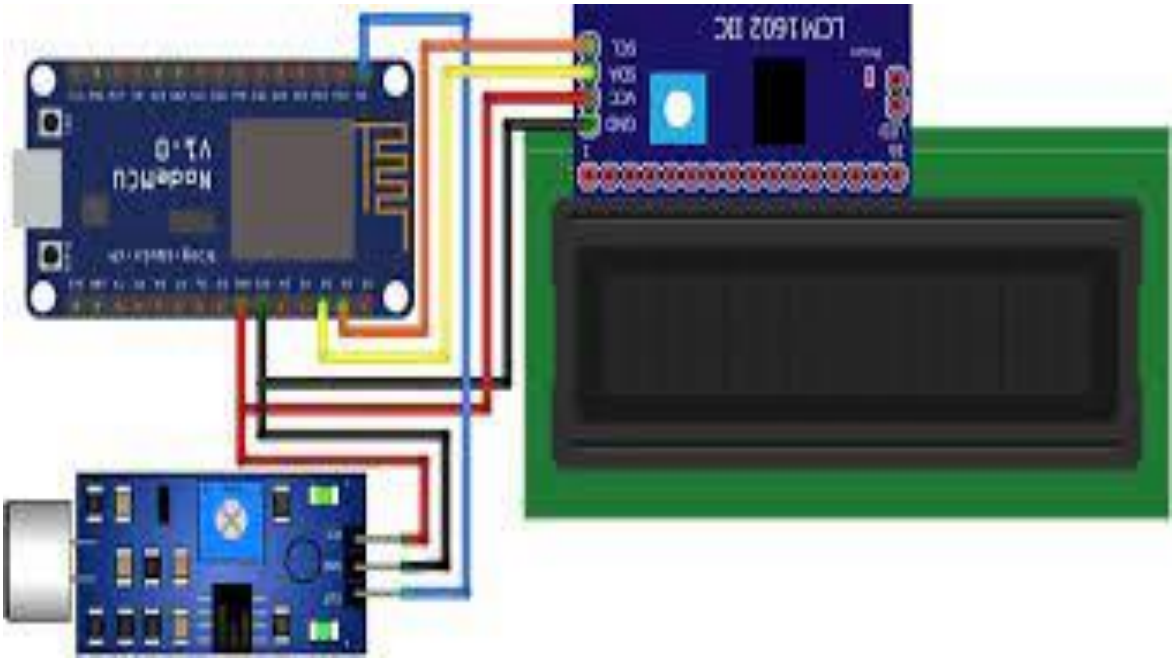




IOT Sensors:

Arduino Nano

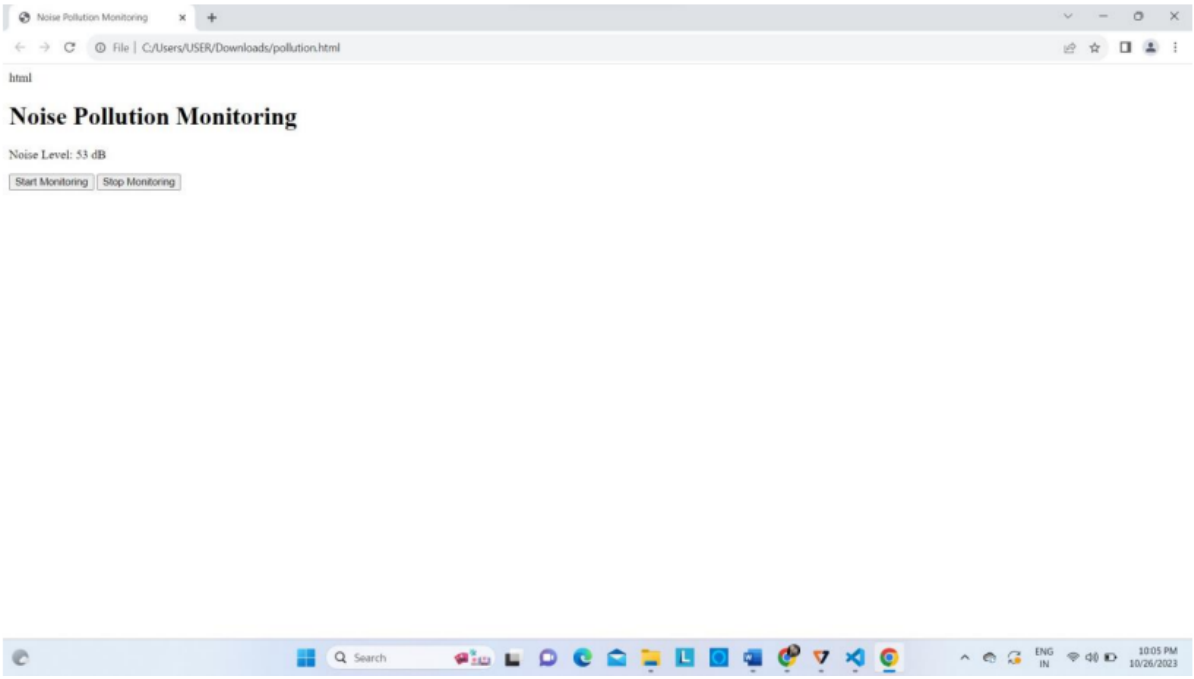
Design of Noise Pollution Monitoring System:



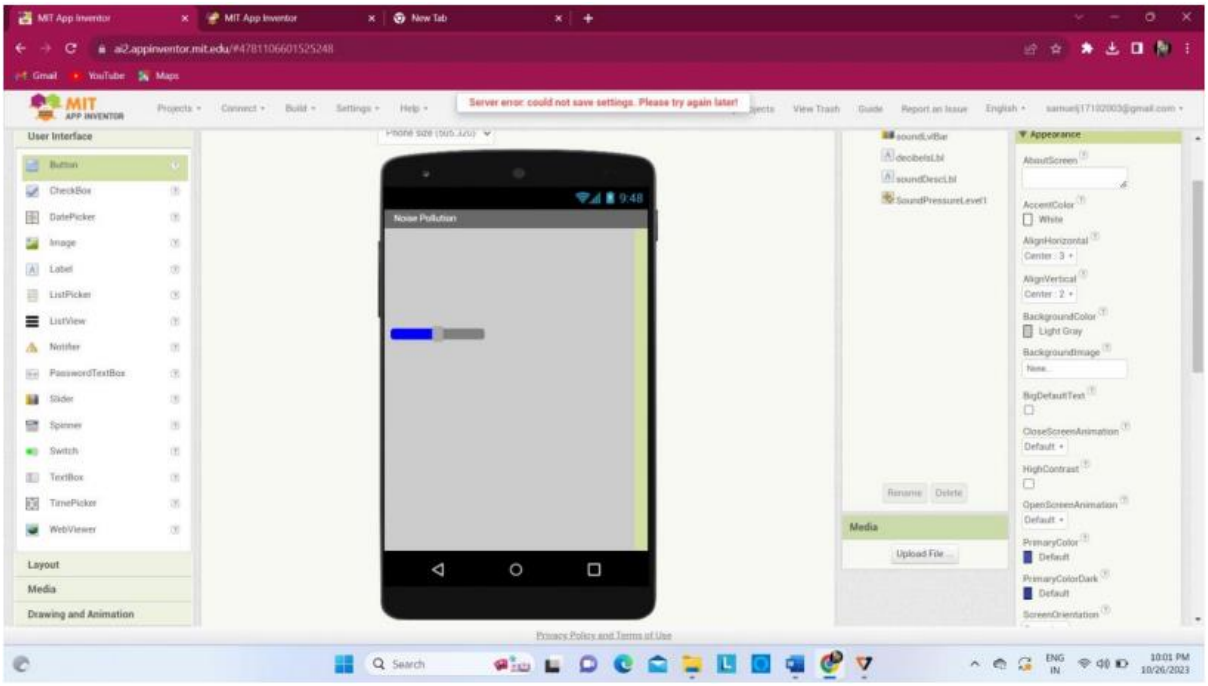
Creating a real-time Noise Pollution Monitoring by using HTML Program to Web Development:

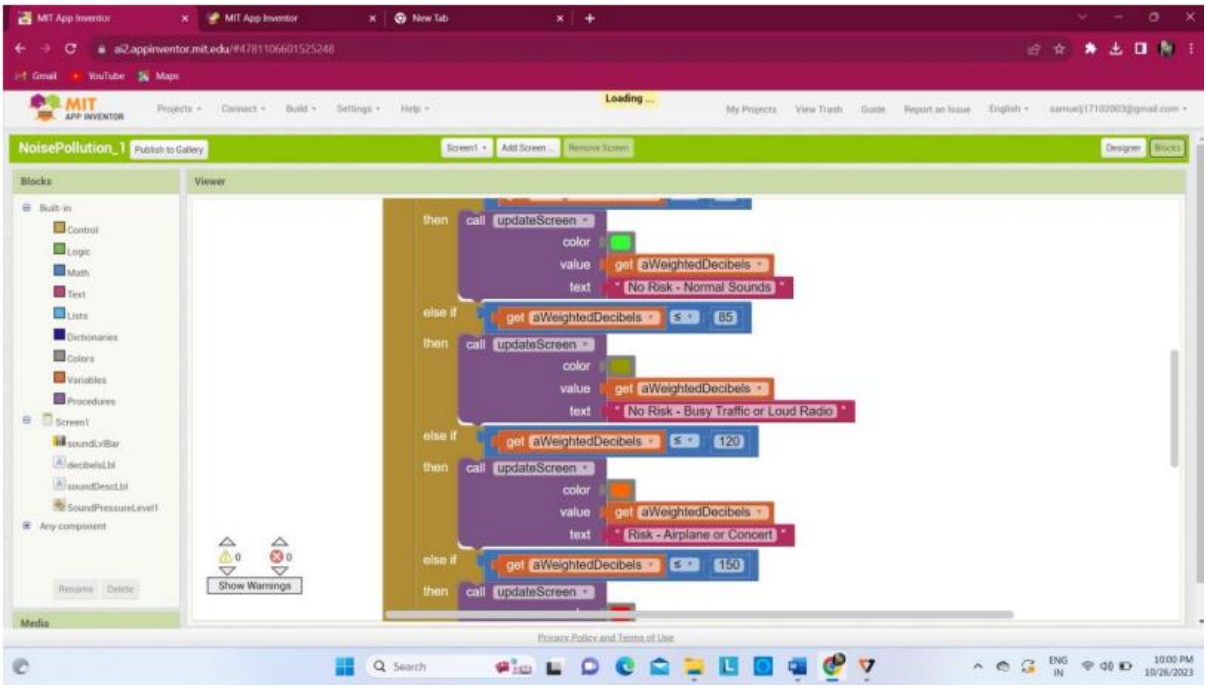
```
html
<!DOCTYPE html>
<html>
<head>
 <title>Noise Pollution Monitoring</title>
</head>
<body>
 <h1>Noise Pollution Monitoring</h1>
 <div id="noiseLevel">
 <p>Noise Level: <span id="currentNoise">0 dB</span></p>
 </div>
 <button id="startMonitoring">Start Monitoring</button>
 <button id="stopMonitoring">Stop Monitoring</button>
 <script>
 const currentNoiseDisplay = document.getElementById("currentNoise");
 const startMonitoringButton = document.getElementById("startMonitoring");
 const stopMonitoringButton = document.getElementById("stopMonitoring");
 let monitoringInterval;
 // Add event listeners to start and stop monitoring
 startMonitoringButton.addEventListener("click", startMonitoring);
 stopMonitoringButton.addEventListener("click", stopMonitoring);
 function startMonitoring() {
 monitoringInterval = setInterval(updateNoiseLevel, 1000); // Update noise level every
second
 }
 function stopMonitoring() {
 clearInterval(monitoringInterval);
 }
 function updateNoiseLevel() {
 // You would need to implement a method to fetch the noise level here
```

```
// For simplicity, let's assume it's a random value between 50 and 80 dB
const noiseLevel = Math.floor(Math.random() * (80 - 50 + 1)) + 50;
currentNoiseDisplay.textContent = noiseLevel + " dB";
}
</script>
</body>
</html>
```



Mobile app Developmet to measure the Noise Pollution Monitoring:

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Screen1
soundLvlBar
decibelsLbl
soundDescLbl
SoundPressureLevel1
Any component
Rename
Delete
Media
Show Warnings
then call updateScreen
color
value
get aWeightedDecibels
text
" No Risk - Normal Sounds "
else if
get aWeightedDecibels ≤ 85
then call updateScreen
" No Risk - Busy Traffic or Loud Radio "
get aWeightedDecibels ≤ 120
then call updateScreen
" Risk - Airplane or Concert "
get aWeightedDecibels ≤ 150
then call updateScreen
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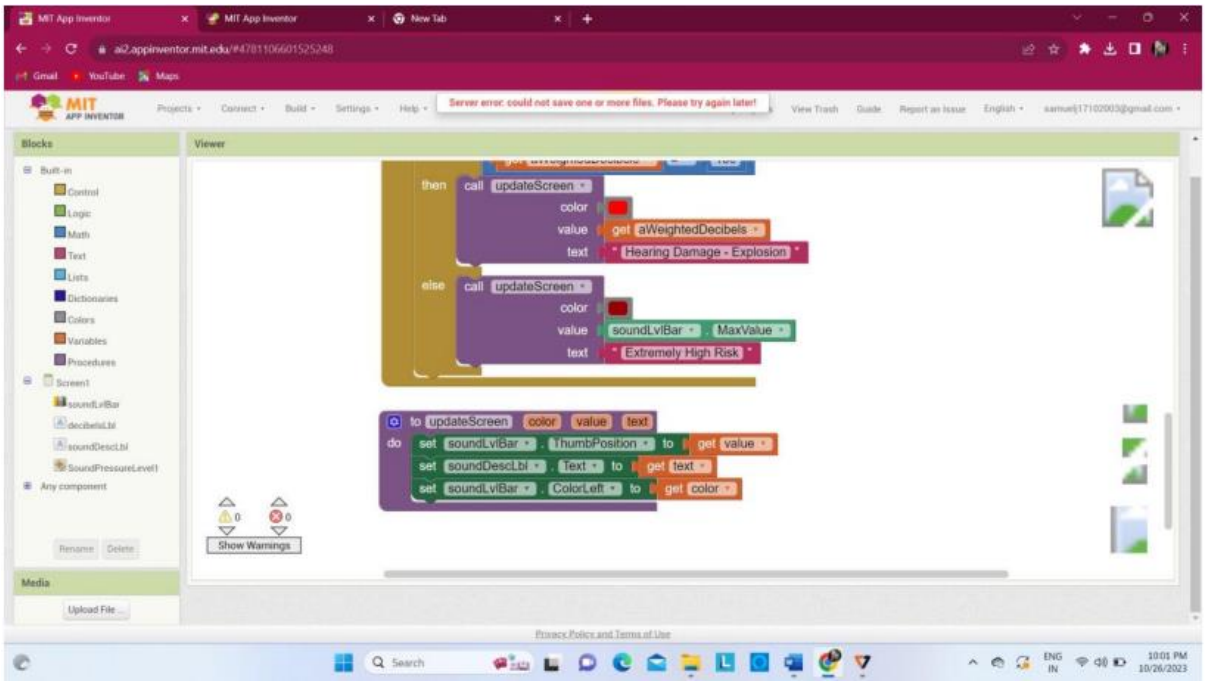
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Screen1
soundLvlBar
decibelsLbl
soundDescLbl
SoundPressureLevel1
Any component
Rename
Delete
Media
Upload File ...
Show Warnings
then call updateScreen
color
value
get aWeightedDecibels
text
" Hearing Damage - Explosion "
else call updateScreen
soundLvlBar . MaxValue
" Extremely High Risk "
to updateScreen color value text
do set soundLvlBar . ThumbPosition to get value
set soundDescLbl . Text to get text
set soundLvlBar . ColorLeft to get color
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