

PROBLEM STATEMENT

“Delhi has gotten severely polluted, and plants required for day to day use are unable to grow in the region. The smoke has travelled far and wide, creating a havoc for agriculture. Delhi wants to implement warehouses in which plants will grow indoors, to do this - engineers have to come up with a device, that will measure light intensity, temperature, humidity and carbon dioxide levels in the warehouse environment, and visualise this data for decision making.”

METHODOLOGY

- We first tested the functioning of the Arduino by making the LED present on it blink.
- Next, we moved to the LED matrix. Our aim was to blink the LEDs to test it's functioning but they weren't blinking. We kept aside the matrix for some time.
- We then setup the circuit of the MQ135 sensor. Our monitor testing was successful and we obtained a range of 260 - 320 ppm.
- Next, we took up the DHT11 sensor. We were initially getting a constant negative output of -999.99 but we figured out the error and rectified the circuit to obtain the required output. The range for temperature was 26-29 degrees celsius and that of humidity was 30 - 55 %.

- Next, we assembled the circuit for LDR. The range obtained was 300 - 1000 lux and under normal conditions the value was around 700 lux.
- We then integrated all the three sensors on the breadboard and ran a successful monitor test.
- Finally, we moved back to the LED matrix. Despite our efforts, we weren't able to obtain the required variations on the matrix.
- Hence, we switched to the RGB display and programmed accordingly.
- We then realised that the LED Matrix provided to us was faulty. Hence, we changed our matrix and used another one.
- On subsequent programming, we were able to obtain required conditions as an output on the matrix.
- We then integrated working of the RGB display and the LED matrix to obtain outputs simultaneously.

CHALLENGES FACED

- While working with the MQ 135 sensor, we were using the wrong port.
- In spite of correct connections, coding of the LED matrix was posing difficulties.
- While assembling circuit for the DHT11 sensor, we weren't putting a resistance across it.
- There was a slight confusion regarding ports while integrating all three sensors.

NOTE : *LED matrix turned out to be faulty taking up around two hours of our time.*

WHAT NEXT?

- Generalising the problem solution for various other conditions like growing multiple plants in the same environment (following incorporation of multiple sensors) etc. would be the next step.
- Once all conditions and factors can be accounted for, we can extend our solution and use Internet of Things (IOT) to develop a mobile application or a software.