SIT – 225

DATA CAPUTURE TECNOLOGIES

TASK 3.2C

TASK OBJECTIVE –

1. Already done in task 3.1P
2. This project operates from the assumption that the environment becomes unsafe when the temperature being returned by the DHT22 rises above a certain level (23 °C). This could indicate overheating in an enclosed space, discomfort in a space that should remain cool, or an early indication of malfunctioning equipment. The DHT22 is capable of measuring both temperature and humidity, making it an appropriate sensor for this project. It is important that the sensor can return the type of environmental data to be monitored so that researchers can easily define the safety ranges. The DHT22 is also inexpensive, standardized, and widely used. Additionally, the DHT22 integrates well with the Arduino Nano 33 IoT board, which makes monitoring this data easy to continue with IoT Cloud.

Monitoring the present state can be determined simply by sampling the temperature from freshly read data at a small time interval (i.e., once a second) while of course respecting the sensor's 2-second refresh rate. Each time a new temperature value is sampled the value is sent to the IoT Cloud dashboard so the user can see the updated live value of the temperature. When the real-time measurement crosses the defined threshold temperature of 23 °C, the alarm variable in Arduino IoT Cloud is updated to read "true," activating a linked dashboard widget (i.e., LED, notification, etc.) that provides visual feedback on the alarm condition while displaying the real-time value of the temperature on the dashboard as well. Dashboard feedback provides both the real-time measurement and a clear, visual warning when conditions exceed the safe threshold. To make the system more fail-safe, the alarm condition remains "latched" until the user manually resets the state from the dashboard, leaving no doubt as to whether an important event was missed.

In conclusion, the premise of this concept is that readings in excess of 23 °C represent an unsafe or bad state. The DHT22 is selected for its capability to accurately read this kind of ecological data, and by using the Arduino IoT Cloud, new sensor data is instantly reported on the dashboard as both a number and alarm meaning. This allows for an obvious and useful structure to report emergency situations.

1. I've opted to use a Gauge widget for temperature because it conveys the value literally and provides an easy-to-read visual scale, allowing for real-time updates from the DHT22 sensor. For the alarm, I chose to use a Switch widget because it displays a clear ON/OFF state when there is an emergency and allows the user to manually reset the alarm from the dashboard. Within the code whenever the temperature exceeds 23 °C, the alarm variable is set to true to trigger the Switch so that the alarm is automatically engaged and remains in an active state until the user resets it off.
2. <https://youtu.be/vC8a_T3Ngbo>



