IoT Competition using Raspberry Pi

Intel IoT Club, Amrita Vishwa Vidyapeetham

Date: August 19, 2023 (Saturday) – 10 AM to 4 PM

Event: Online

Group No –

Team Member:

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Abstract:

The "Multisensory Weather Forecast Display" is an interactive fusion of art and technology. It utilizes various sensors, including temperature, humidity, light, and sound sensors, alongside a color LCD display to present weather conditions in a visually captivating manner. User interaction is facilitated through a mobile app, while the integration of a data API ensures the accuracy of real-time weather forecasts. This project offers an engaging and immersive way to experience weather information, appealing to both aesthetics and functionality.

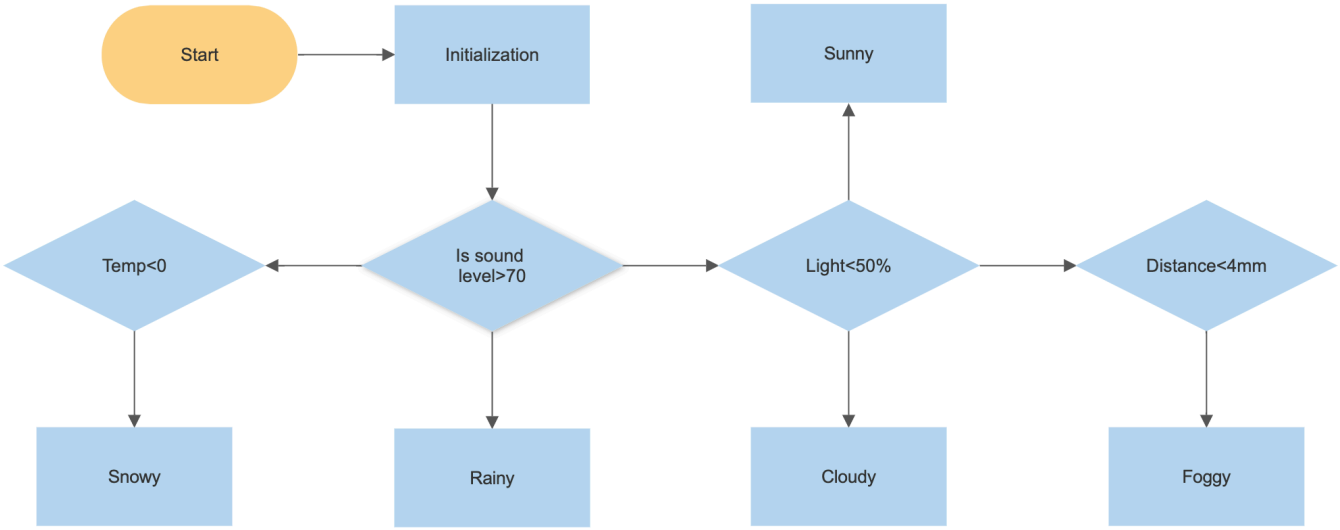
Introduction:

In a world increasingly shaped by technology, the "Multisensory Weather Forecast Display" brings a fresh perspective to weather forecasting. This project combines art and technology to offer an engaging, interactive way to explore weather conditions. Using sensors and a vivid color display, it transforms weather data into an immersive experience that's both informative and visually captivating. In a nutshell, it's about making checking the weather forecast a delightful and multisensory journey.

Hardware Required:

1. Raspberry Pi 3
2. Grove Pi Sensors
    a. Colour LCD Display
    b. Temperature and Humidity Sensor
    c. Light Sensor
    d. Sound Sensor and Buzzer
    e. Ultrasonic Sensor
    f. Rotatory Sensor and Switch

Flow chart:



Purpose of each sensor:

Sound sensor: The sound sensor is used to measure the sound level in the environment. This can be used to determine if it is raining or snowing.

Temperature sensor: The temperature sensor is used to measure the temperature of the environment. This can be used to determine if it is hot or cold outside.

Light sensor: The light sensor is used to measure the amount of light in the environment. This can be used to determine if it is cloudy or sunny outside.

Ultrasonic sensor: The ultrasonic sensor is used to measure the distance to an object. This can be used to determine if there is fog in the air.

Rotary sensor: The rotary sensor is used to measure the rotation of an object. This can be used to change the weather conditions manually.

Buzzer: Used to make a sound when the weather conditions change. This can be used to alert the user to the change in weather conditions.

How it Works:

- The first step is to initialize the sensors. This is done by creating a new object for each sensor and passing in the GPIO pin that the sensor is connected to.
- The next step is to initialize the LCD display. This is done by creating a new object for the LCD display and passing in the number of columns and rows on the display.
- The default weather conditions are set to "Sunny".
- The main loop starts and continues to run forever.
- In the main loop, the sensor data is read. This is done by calling the `value()` method on each sensor object.

- The weather conditions are updated based on the sensor data. This is done by checking the value of each sensor and comparing it to a threshold value. For example, if the sound level is greater than 70, then the weather conditions are set to "Rainy".
- The LEDs and buzzer are updated based on the weather conditions. This is done by calling the `on()` or `off()` method on each LED or buzzer object.
- The LCD display is updated with the current weather conditions. This is done by calling the `clear()` and `write()` methods on the LCD display object.
- The user is given the opportunity to change the weather conditions manually by pressing the button. This is done by checking the `is_pressed()` method on the button object.
- The main loop sleeps for one second before looping back to the beginning.

Conclusion:

The "Multisensory Weather Forecast Display" marries technology and artistry, reshaping weather forecasts into immersive experiences. By harnessing sensors, it reacts dynamically to environmental cues, illuminating LEDs, and harmonizing with weather conditions. The elegant LCD canvas transforms data into captivating visuals. This project exemplifies how innovation can elevate even the simplest tasks, making them engaging and enriching.