LAB-2

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Aim:

Use the inbuilt ADC on the esp32 to read Analog inputs from

- A water level sensor to estimate the water level in a container
- The capacitive touch GPIO pins to detect human touch.
- Implement a system that can remember the current water level on touch input and indicate if the water level goes higher or lower using an LED.

Hardware picture:
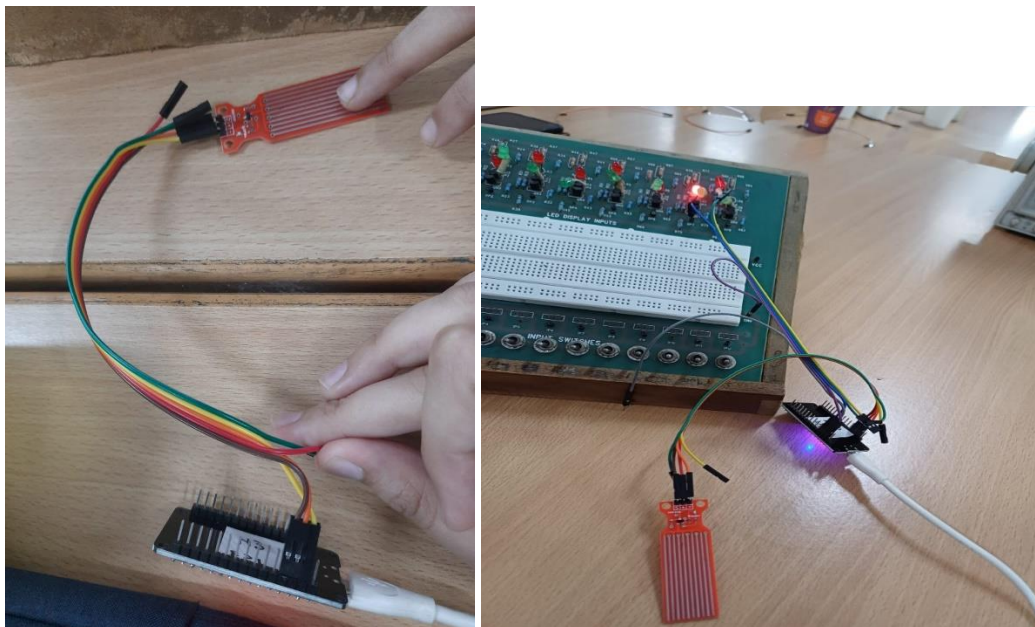
Observations:

In the 1st part of the experiment, we observe that analog output given by sensor is being converted into digital number using ADC pins on esp32. As the sensor is immersed more, it results in better conductivity and will result in a lower resistance. If the sensor is immersed less, it results in poor conductivity and will result in a higher resistance. This can be observed by seeing output voltages displayed on serial monitor.

In the 2nd part of the experiment, we observe that external LED connected to sensor and esp32 glows if touch is detected and that touch value is higher than a certain threshold.

In the 3rd part of the experiment, we observe that water level is repeatedly being recorded and when touch is detected water level is updated. When water level is lower than required water level, LED

glows indicating that water level is lower and stops glowing when water level is restored or another touch pin is activated. It helps us know water level reading when required by activating touch pin and water level is printed on serial monitor.

We observe that range of values of analog output that is converted into digital number is from 0 to 4095.

Challenges faced during the experiment:

We faced challenge during 3rd part of the experiment in writing a part of code related to required_water_level.

Conclusions:

We used the ADC pins in the esp32 to read analog outputs from a water level sensor and capacitative Touch GPIO pin. We also estimated the water level in the container and glowing of LED can be controlled according to the water level in the container. We can also modify the code to make other LED glow if there is an overflow. This helps us identify both the cases if water level is lower or higher than what is required. We can come to a conclusion that we can use this sensor, LEDs to build a system which detects the level of water, stores water level, gives reading when required and notifies us about overflow or restoring water level.