



Robotics

Task 4: LDR Light Sensor Controlled LED on ESP32

I. Components Used

- ESP32
- LED
- 330-ohm resistor
- Breadboard
- Jumper wires
- LDR (Light Dependent Resistor)
- 10k-ohm resistor (for LDR voltage divider)

II. Circuit Setup

- The anode (longer leg) of the LED was connected to a GPIO pin on the ESP32.
- The cathode (shorter leg) of the LED was connected to one end of the 330-ohm resistor.
- The other end of the resistor was connected to the ground (GND) of the ESP32.
- The LDR was connected in a voltage divider circuit with a 10k-ohm resistor.

- One end of the LDR was connected to 3.3V, and the other end was connected to an analog input pin on the ESP32.
- The 10k-ohm resistor was connected between the analog input pin and GND to complete the voltage divider circuit.

III. Implementation

- Configuring the LDR sensor to read analog values.
- Setting a predefined light threshold to turn the LED on or off.
- Writing logic to continuously monitor light levels and adjust LED behavior accordingly.

IV. Code Overview

- The LDR continuously measures ambient light intensity.
- If the measured value falls below a set threshold, indicating darkness, the LED turns on.
- If the light level is above the threshold, the LED remains off.

V. Testing and Results

- After uploading the code to the ESP32: The LED correctly responded to changes in light intensity, turning on in low-light conditions and off in bright conditions and the LDR sensor effectively detected ambient light levels, demonstrating the proper functioning of the voltage divider circuit.