Robotics

Task 2: Fading LED on ESP32

I. Components Used

- ESP32
- LED
- 330-ohm resistor
- Breadboard
- Jumper wires
- Potentiometer

II. Circuit Setup

- The anode (longer leg) of the LED was connected to a PWM-capable 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 middle pin of the potentiometer was connected to an analog input pin of the ESP32.

- The other two pins of the potentiometer were connected to 3.3V and GND, respectively.
- The ESP32 was powered via USB through the development board.

III. Implementation

- Initializing the PWM channel on the ESP32.
- Reading the potentiometer value using the ADC (Analog-to-Digital Converter).
- Mapping the potentiometer value to a duty cycle to vary the brightness of the LED.
- Implementing a loop to continuously update the LED brightness based on the potentiometer input.

IV. Testing and Results

- After uploading the code to the ESP32, the LED brightness was successfully controlled by rotating the potentiometer, confirming proper ADC and PWM functionality.