
Fade LED Using LDR on ATtiny

Objective:
Use an LDR (Light Dependent Resistor) to control the brightness of an LED based on ambient light using an ATtiny microcontroller.

Components Required:

- ATtiny85 or ATtiny13
- 1 LED
- 1 Resistor (for LED, e.g., 220Ω)
- 1 LDR
- 1 Resistor (10kΩ for LDR voltage divider)
- Breadboard, jumper wires
- USBasp/Arduino as ISP for programming

Circuit Overview:

- Create a **voltage divider** using the LDR and a 10kΩ resistor.
    - One end to VCC, the other to GND, with the midpoint going to an **analog input** on the ATtiny.
- Connect the **LED to a PWM-capable pin** through a resistor.
- The ATtiny reads the light level and adjusts LED brightness accordingly using **PWM**.

Working Principle:

- When ambient light is **low**, the LDR's resistance is **high**, voltage increases — LED fades **brighter**.
- When ambient light is **high**, LDR resistance drops — LED fades **dim**.
- The ATtiny maps LDR values to PWM output to smoothly adjust LED brightness.

Use Cases:

- Automatic night lights
- Light-reactive decorations

- Low-power smart lighting with minimal components

Note:
You'll need to **burn the bootloader** and upload code using an ISP programmer or Arduino as ISP.
