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import RPi.GPIO as GPIO
import time
class LEDController:
    def __init__(self, pin, frequency=100):
        self.pin = pin
        self.frequency = frequency
        GPIO.setmode(GPIO.BCM)
        GPIO.setup(self.pin, GPIO.OUT)
        self.pwm = GPIO.PWM(self.pin, self.frequency)
        self.pwm.start(0)
    def fade_led(self, step=5, delay=0.05):
        try:
            while True:
                for duty in range(0, 101, step):
                    self.pwm.ChangeDutyCycle(duty)
                    time.sleep(delay)
                for duty in range(100, -1, -step):
                    self.pwm.ChangeDutyCycle(duty)
                    time.sleep(delay)
        except KeyboardInterrupt:
            self.cleanup()
    def blink_led(self, interval=1):
        try:
            while True:
                GPIO.output(self.pin, GPIO.HIGH)
                time.sleep(interval)
                GPIO.output(self.pin, GPIO.LOW)
                time.sleep(interval)
        except KeyboardInterrupt:
            self.cleanup()
    def cleanup(self):
        self.pwm.stop()
        GPIO.cleanup()
        print("GPIO cleanup done.")
if __name__ == "__main__":
    led = LEDController(pin=18)
         mode = input("Enter 'fade' for fade effect or 'blink' for blinking:
").strip().lower()
    if mode == "fade":
        led.fade led()
    elif mode == "blink":
        led.blink_led()
    else:
        print("Invalid mode selected.")
        led.cleanup()
```