Experiment 4

Program:

import RPi.GPIO as GPIO

import time

GPIO.setmode(GPIO.BOARD)

led\_pin = 11

GPIO.setup(led\_pin, GPIO.OUT)

try:

while True:

GPIO.output(led\_pin, GPIO.HIGH)

print(f"LED set to HIGH (pin {led\_pin})")

time.sleep(0.5)

GPIO.output(led\_pin, GPIO.LOW)

print(f"LED set to LOW (pin {led\_pin})")

time.sleep(0.5)

except KeyboardInterrupt:

GPIO.cleanup()

print("Program stopped")

Output:

A screen shot of a computer program

AI-generated content may be incorrect.

Experiment 5

Write a program using Arduino to control LED (One or more ON/OFF). Or Blinking

Program:

const int ledPin = 13;

void setup() {

pinMode(ledPin, OUTPUT);

}

void loop() {

digitalWrite(ledPin, HIGH);

delay(1000);

digitalWrite(ledPin, LOW);

delay(1000);

}

Output:

A screenshot of a computer

AI-generated content may be incorrect.

Experiment 6

Create a program that illuminates the green LED if the counter is less than 100, illuminates the yellow LED if the counter is between 101 and 200 and illuminates the red LED if the counter is greater than 200

Program:

const int greenLedPin = 13; // Green LED pin

const int yellowLedPin = 12; // Yellow LED pin

const int redLedPin = 11; // Red LED pin

int counter = 0;

void setup() {

pinMode(greenLedPin, OUTPUT);

pinMode(yellowLedPin, OUTPUT);

pinMode(redLedPin, OUTPUT);

Serial.begin(9600);

}

void loop() {

counter++;

Serial.print("Counter: ");

Serial.println(counter);

if (counter < 100) {

digitalWrite(greenLedPin, HIGH);

digitalWrite(yellowLedPin, LOW);

digitalWrite(redLedPin, LOW);

} else if (counter >= 100 && counter <= 200) {

digitalWrite(greenLedPin, LOW);

digitalWrite(yellowLedPin, HIGH);

digitalWrite(redLedPin, LOW);

} else if (counter > 200) {

digitalWrite(greenLedPin, LOW);

digitalWrite(yellowLedPin, LOW);

digitalWrite(redLedPin, HIGH);

}

if (counter >= 300) {

counter = 0;

}

delay(100);

}

Output:

A screenshot of a computer program

AI-generated content may be incorrect.

Experiment 7

Create a program so that when the user enters ‘b’ the green light blinks, ‘g’ the green light is illuminated ‘y’ the yellow light is illuminated and ‘r’ the red light is illuminated

Program:

const int greenLedPin = 13;

const int yellowLedPin = 12;

const int redLedPin = 11;

void setup() {

pinMode(greenLedPin, OUTPUT);

pinMode(yellowLedPin, OUTPUT);

pinMode(redLedPin, OUTPUT);

Serial.begin(9600);

Serial.println("Enter 'b' for blink, 'g' for green, 'y' for yellow, 'r' for red:");

}

void loop() {

if (Serial.available() > 0) {

char input = Serial.read();

Serial.println(input);

switch (input) {

case 'b':

blinkGreen();

break;

case 'g':

digitalWrite(greenLedPin, HIGH);

digitalWrite(yellowLedPin, LOW);

digitalWrite(redLedPin, LOW);

break;

case 'y':

digitalWrite(greenLedPin, LOW);

digitalWrite(yellowLedPin, HIGH);

digitalWrite(redLedPin, LOW);

break;

case 'r':

digitalWrite(greenLedPin, LOW);

digitalWrite(yellowLedPin, LOW);

digitalWrite(redLedPin, HIGH);

break;

default:

Serial.println("Invalid input.");

}

}

}

void blinkGreen() {

for (int i = 0; i < 5; i++) { // Blink 5 times

digitalWrite(greenLedPin, HIGH);

delay(250);

digitalWrite(greenLedPin, LOW);

delay(250);

}

}

Output:

A computer screen shot of a computer

AI-generated content may be incorrect.

Experiment 8

Write a program that asks the user for a number and outputs the number squared that is entered

Program: (Arduino Uno)

void setup() {

Serial.begin(9600);

Serial.println("Enter a number: ");

}

void loop() {

if (Serial.available() > 0) {

int num = Serial.parseInt();

int squared = num \* num;

Serial.print("The square of ");

Serial.print(num);

Serial.print(" is ");

Serial.println(squared);

Serial.println("Enter another number: ");

}

}

Output:

A white rectangular object with a black border

AI-generated content may be incorrect.

Experiment 9

Write a program to control the color of the LED by turning 3 different potentiometers. One will be read for the value of Red, one for the value of Green, and one for the value of Blue

Program:

const int redPin = 9;

const int greenPin = 10;

const int bluePin = 11;

const int redPot = A0;

const int greenPot = A1;

const int bluePot = A2;

void setup() {

pinMode(redPin, OUTPUT);

pinMode(greenPin, OUTPUT);

pinMode(bluePin, OUTPUT);

}

void loop() {

int redValue = analogRead(redPot) / 4; // Scale 0-1023 to 0-255

int greenValue = analogRead(greenPot) / 4;

int blueValue = analogRead(bluePot) / 4;

analogWrite(redPin, redValue);

analogWrite(greenPin, greenValue);

analogWrite(bluePin, blueValue);

}

Output:

A computer screen shot of a circuit board

AI-generated content may be incorrect.