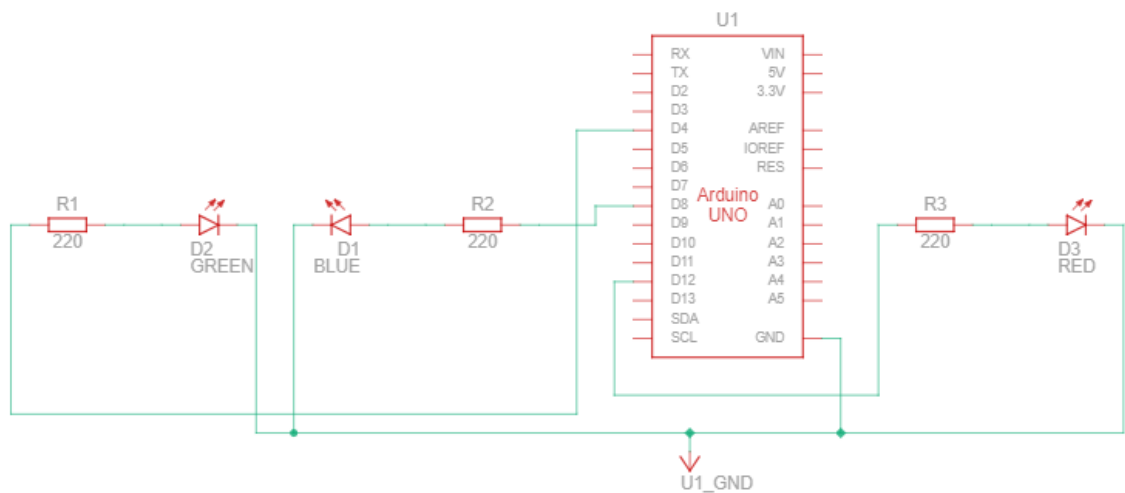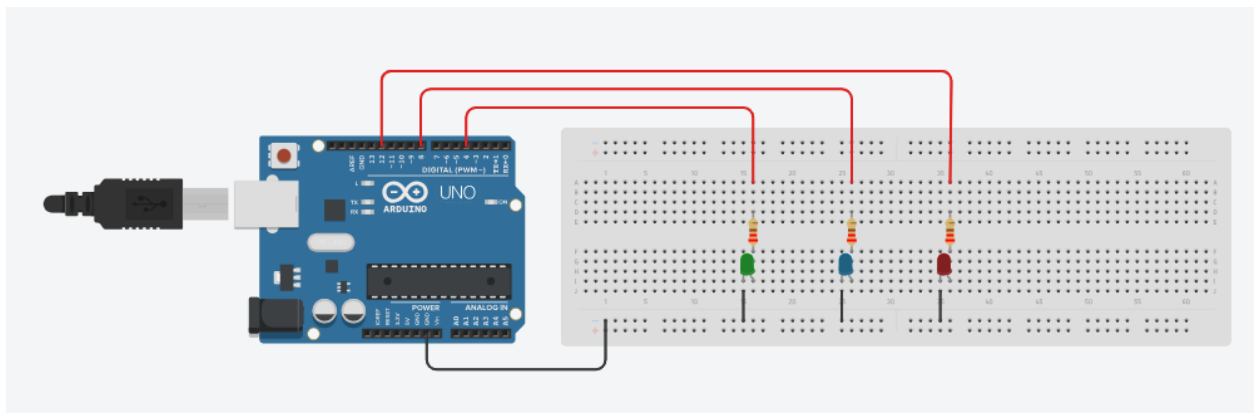Mã lớp: 12324-CT29501

Họ và tên: Nguyễn Phúc Nguyên Khoa

MSSV: B2110083

Ex 2.1 Create a program that

– when the user enters '1' all lights turn on

– when the user enters '2' all lights flash

– when the user enters '3' lights cycle repeatedly

– when the user enters 'q' or 'e' the lights turn off

– when + or - is pressed the speed of the LED increases or decreases

1. Sơ đồ mạch

2. Sơ đồ chân

Arduino	Green led	Blue led	Red led	Ghi chú
D4	Anode			
D8		Anode		
D12			Anode	
GND	Cathode	Cathode	Cathode	

3. Mã lệnh

```cpp
#define GREENLED 4
#define BLUELED 8
#define REDLED 12

int delayTime = 1500;
int input;

bool isTrue = true;

void setup()
{
  Serial.begin(9600);
  pinMode(GREENLED, OUTPUT);
  pinMode(BLUELED, OUTPUT);
  pinMode(REDLED, OUTPUT);
}

void turnOnAllLed() {
  digitalWrite(GREENLED, HIGH);
  digitalWrite(BLUELED, HIGH);
  digitalWrite(REDLED, HIGH);
}

void turnOffAllLed() {
  digitalWrite(GREENLED, LOW);
  digitalWrite(BLUELED, LOW);
  digitalWrite(REDLED, LOW);
}
```

```cpp
void changeSpeed() {
    if (input == 45) {
        delayTime += 50;
    }

    if (delayTime == 0) {
        delayTime = 0;
        return;
    }

    if (input == 43) {
        delayTime -= 50;
    }
}

void mode2() {
  while(Serial.available() == 0 && (input != 'q'
&& input != 101))
  {
    turnOnAllLed();
    delay(delayTime);
    turnOffAllLed();
    delay(delayTime);

    if (Serial.available() > 0) {
      input = Serial.read();
    }

    changeSpeed();

    if (input == 49) {
      turnOnAllLed();
    }

    if (input == 51) {
      mode3();
    }
  }
}
```

```
void mode3() {
  while(Serial.available() == 0 && (input != 'q'
&& input != 101)) {
    digitalWrite(GREENLED, HIGH);
    delay(delayTime);
    digitalWrite(GREENLED, LOW);
    delay(delayTime);
    digitalWrite(BLUELED, HIGH);
    delay(delayTime);
    digitalWrite(BLUELED, LOW);
    delay(delayTime);
    digitalWrite(REDLED, HIGH);
    delay(delayTime);
    digitalWrite(REDLED, LOW);
    delay(delayTime);

    if (Serial.available() > 0) {
      input = Serial.read();
    }

    changeSpeed();

    if (input == 49 || input == 50) break;
  }

  if (input == 49) {
    turnOnAllLed();
  }

  if (input == 50) {
    mode2();
  }
}
```

```
void loop()
{
  if (Serial.available() > 0) {
    input = Serial.read();

    if (input == 49) {
      turnOnAllLed();
    }

    if (input == 50) {
      mode2();
    }

    if (input == 51) {
      mode3();
    }

    if (input == 101 || input == 113) {
      turnOffAllLed();
    }
  }
}
```
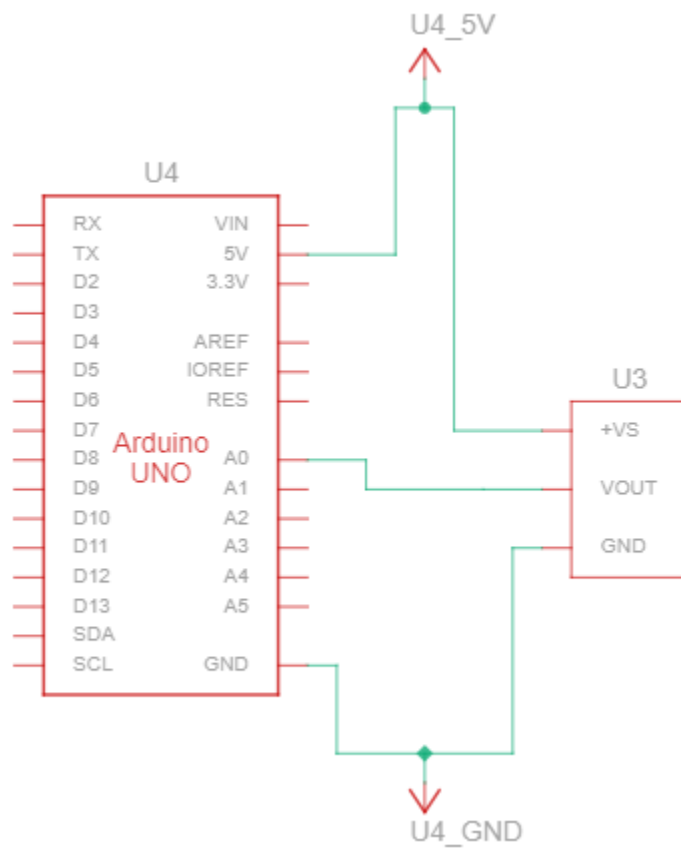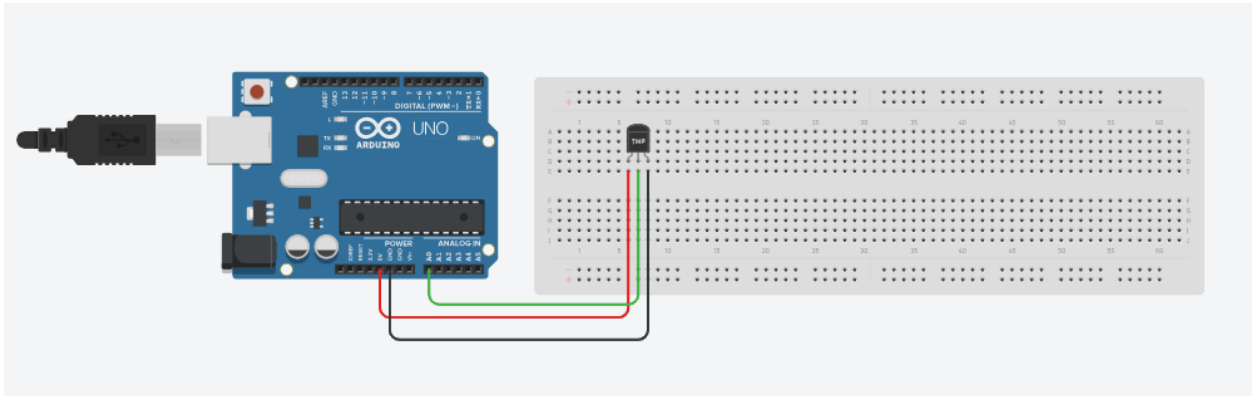
Ex 2.2:

   - Install the circuit to connect the Arduino Uno to the TMP36 temperature sensor.

   - Write a program to read the measured temperature from the temperature sensor and display it on the computer screen

   1. Sơ đồ mạch

2. Sơ đồ chân

Arduino	TMP36	Ghi chú
5V	Power	
GND	GND	
A0	VOUT	

3. Mã lệnh

```
#define sensorPin A0

void setup() {
  Serial.begin(9600);
}

void loop() {
  int reading = analogRead(sensorPin);

  float voltage = reading * 5.0 / 1024.0;

  float temp = voltage * 100.0;

  Serial.println(temp);

  delay(1000);
}
```