



ROBOTICĂ 1 – LABORATOR 5

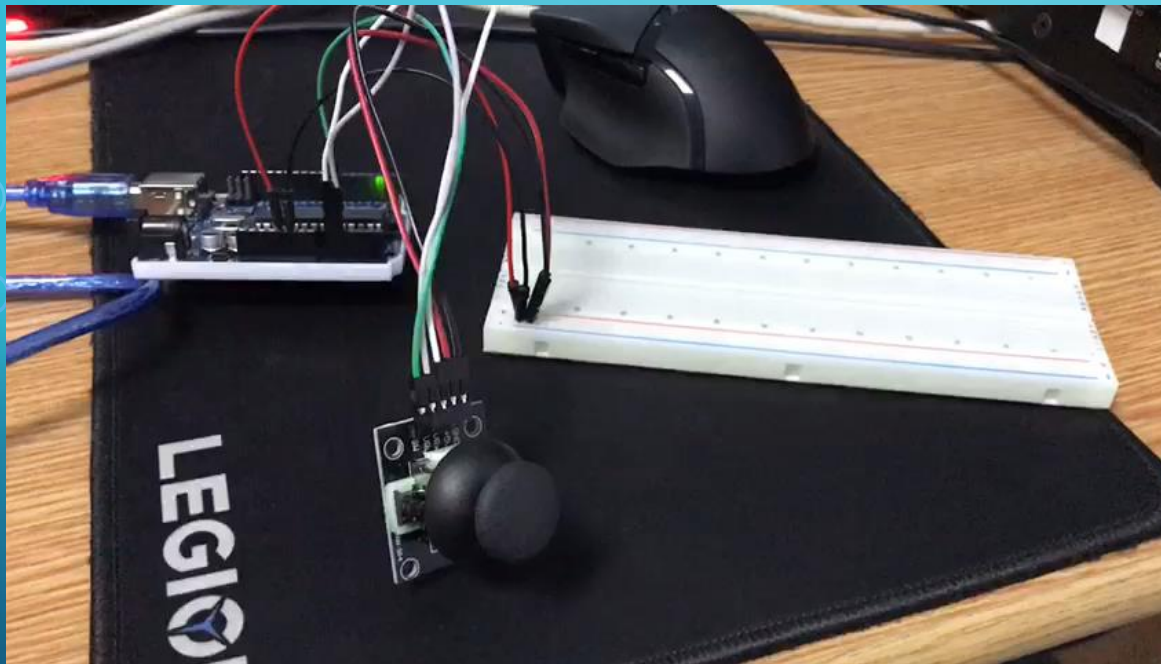
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APLICAȚIA 1

Asamblarea și programarea unui circuit utilizând joystick.

Am legat un joystick la placa Arduino care are 5 pini : GND, +5V, VRx si Vry la pinurile analogice A0, A1 iar SM la un pin digital.



```
int SW = 7;
int X = A0;
int Y = A1;
int val_senzor;

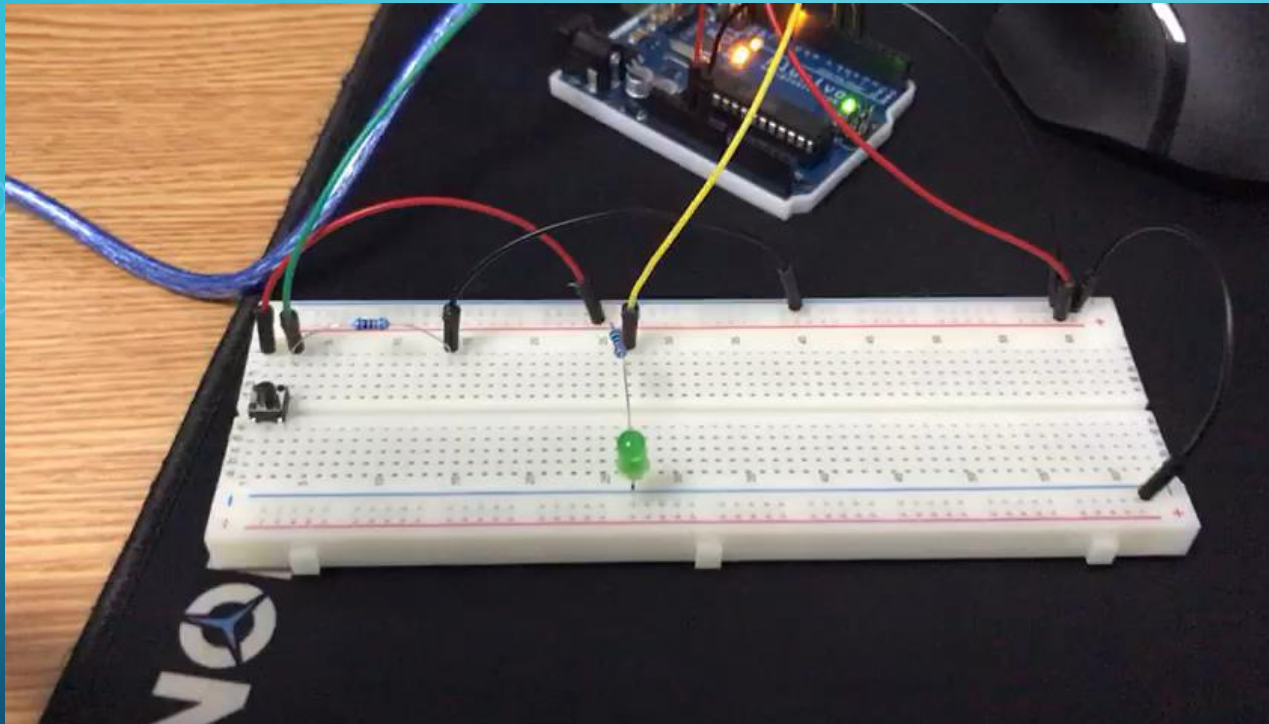
void setup() {
  pinMode(SW,INPUT);
  digitalWrite(SW,HIGH);
  Serial.begin(9600);
}

void loop() {
  Serial.print("X-axis: ");
  val_senzor = analogRead(X);
  Serial.print(val_senzor);
  Serial.print("    |    ");
  Serial.print("Y axis: ");
  val_senzor = analogRead(Y);
  Serial.print(val_senzor);
  Serial.println(" | ");
  delay(1000);
}
```

APLICAȚIA 2

Realizarea și programarea unui circuit utilizând push-buton și un led.

Aici am adaugat un led verde si un rezistor de 220 de Ohm pe care l-am legat la placa arduino la pinul Digital 7, dupa am legat un push-buton cu un rezistor de 10kOhm la pinul digital 5. Iar prin apasarea mentinuta a butonului becul se aprinde, in momentul cand nu mai apesi revine pe modul deschis.



CODUL

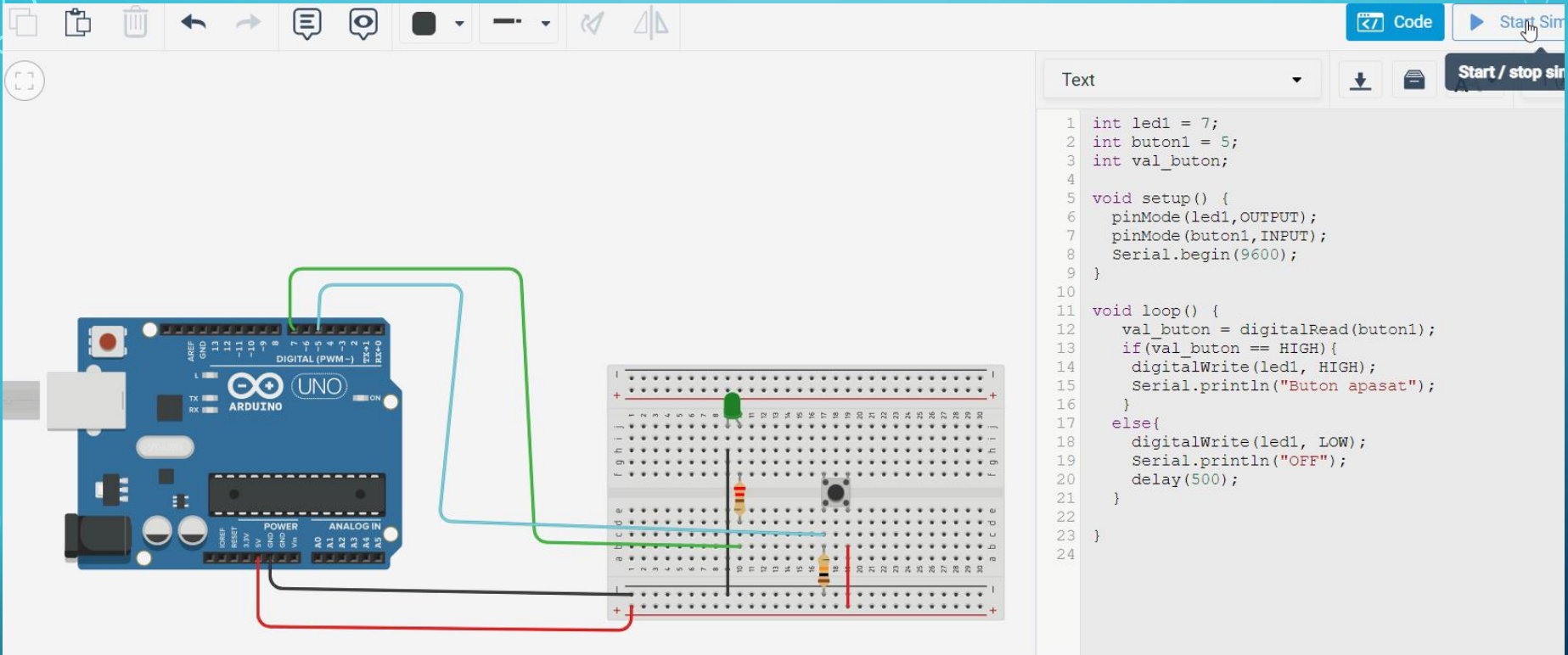
```
int led1 = 7;
int buton1 = 5;
int val_buton;

void setup() {
  pinMode(led1,OUTPUT);
  pinMode(buton1,INPUT);
  Serial.begin(9600);
}

void loop() {
  val_buton = digitalRead(buton1);
  if(val_buton == HIGH){
    digitalWrite(led1, HIGH);
    Serial.println("Buton apasat");
  }
  else{
    digitalWrite(led1, LOW);
    Serial.println("OFF");
    delay(500);
  }
}
```

APLICAȚIA 2

Realizarea și programarea unui circuit utilizând push-buton și un led în TINKERCAD.



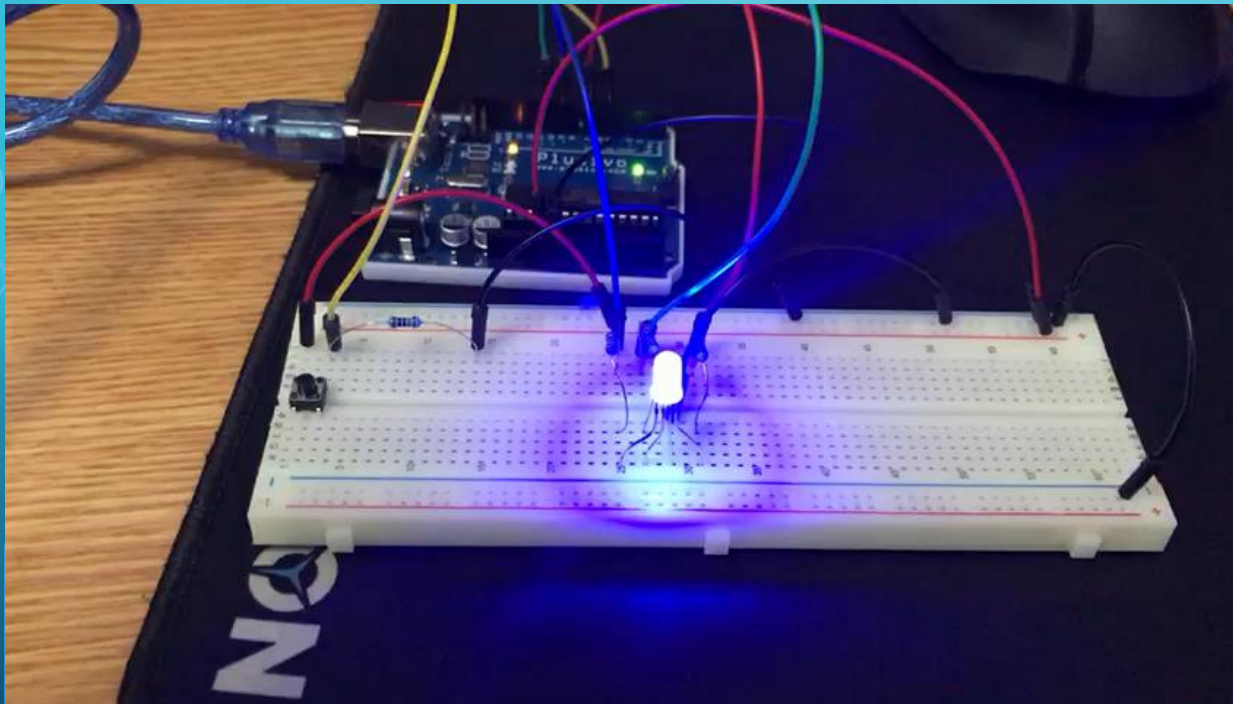
The screenshot displays the Tinkercad workspace with an Arduino Uno board connected to a breadboard. The breadboard circuit includes a push-button and an LED. The wiring is as follows: the push-button's left pin is connected to digital pin 5 (labeled 'buton1'), its right pin is connected to digital pin 7 (labeled 'led1'), and the common ground pin is connected to the GND rail of the breadboard. The LED's anode is connected to digital pin 7 and its cathode is connected to the GND rail. The Arduino's GND is connected to the breadboard's GND rail, and its 5V pin is connected to the 5V rail. The code editor on the right contains the following C++ code:

```
1 int led1 = 7;
2 int buton1 = 5;
3 int val_buton;
4
5 void setup() {
6   pinMode(led1, OUTPUT);
7   pinMode(buton1, INPUT);
8   Serial.begin(9600);
9 }
10
11 void loop() {
12   val_buton = digitalRead(buton1);
13   if(val_buton == HIGH){
14     digitalWrite(led1, HIGH);
15     Serial.println("Buton apasat");
16   }
17   else{
18     digitalWrite(led1, LOW);
19     Serial.println("OFF");
20     delay(500);
21   }
22 }
23
24
```


APLICAȚIA 3

Realizarea și programarea unui circuit cu led RGB și push-buton.

Aici am adaugat un led de tip RGB cu 3 rezistoare de 220 de Ohm pe care l-am legat la pinii Digitali de pe placa iar push-buton-ul este acelasi ca la aplicatia 2, numai ca acum actioneaza modul deschis si inchis prin aprinderea unei culori la ledul RGB in functie de cum e codul scris.



CODUL

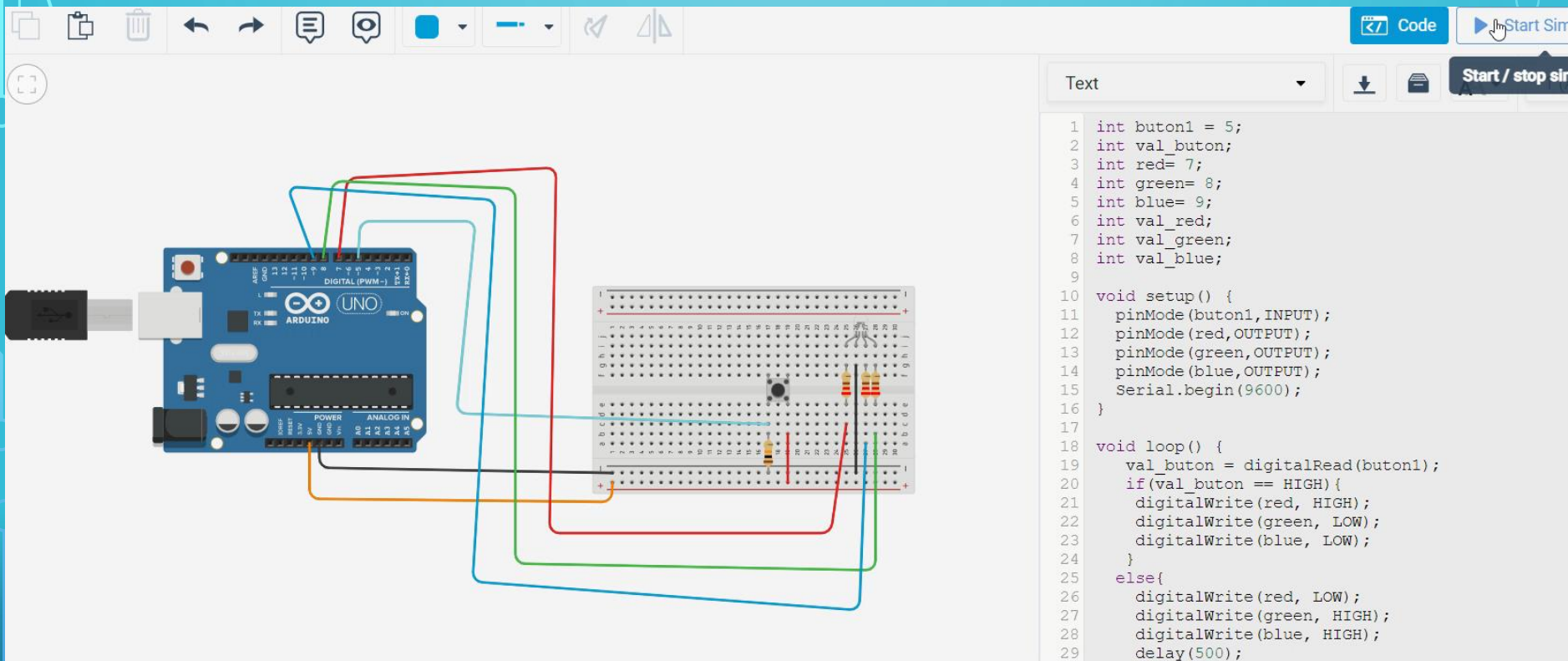
```
int buton1 = 5;
int val_buton;
int red= 7;
int green= 8;
int blue= 9;
int val_red;
int val_green;
int val_blue;

void setup() {
  pinMode(buton1,INPUT);
  pinMode(red,OUTPUT);
  pinMode(green,OUTPUT);
  pinMode(blue,OUTPUT);
  Serial.begin(9600);
}

void loop() {
  val_buton = digitalRead(buton1);
  if(val_buton == HIGH){
    digitalWrite(red, HIGH);
    digitalWrite(green, LOW);
    digitalWrite(blue, LOW);
  }
  else{
    digitalWrite(red, LOW);
    digitalWrite(green, HIGH);
    digitalWrite(blue, HIGH);
    delay(500);
  }
}
```

APLICAȚIA 3

Realizarea și programarea unui circuit cu led RGB și potențiometru în TINKERCAD.



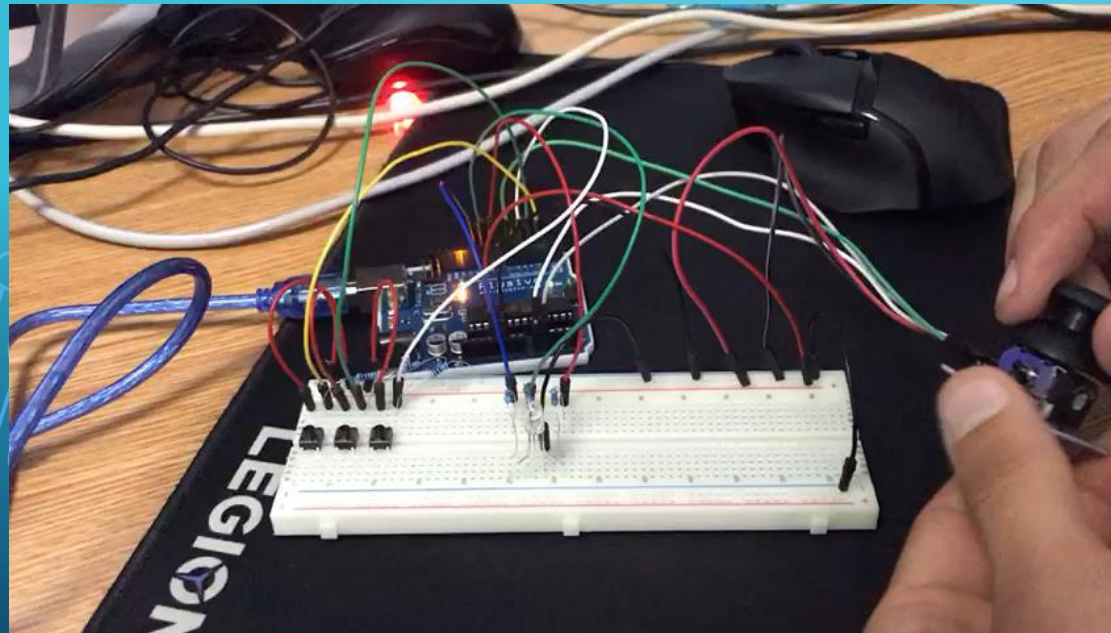
The screenshot displays the Tinkercad workspace with an Arduino Uno microcontroller board connected to a breadboard. The breadboard contains an RGB LED and a potentiometer. Wires connect the Arduino pins to the components: the potentiometer's wiper is connected to digital pin 5, and its outer pins are connected to digital pins 7, 8, and 9. The RGB LED's anode is connected to digital pin 7, and its cathode is connected to digital pin 9. The code editor on the right shows the following program:

```
1  int buton1 = 5;
2  int val_buton;
3  int red= 7;
4  int green= 8;
5  int blue= 9;
6  int val_red;
7  int val_green;
8  int val_blue;
9
10 void setup() {
11   pinMode(buton1,INPUT);
12   pinMode(red,OUTPUT);
13   pinMode(green,OUTPUT);
14   pinMode(blue,OUTPUT);
15   Serial.begin(9600);
16 }
17
18 void loop() {
19   val_buton = digitalRead(buton1);
20   if(val_buton == HIGH){
21     digitalWrite(red, HIGH);
22     digitalWrite(green, LOW);
23     digitalWrite(blue, LOW);
24   }
25   else{
26     digitalWrite(red, LOW);
27     digitalWrite(green, HIGH);
28     digitalWrite(blue, HIGH);
29     delay(500);
```

APLICAȚIA 4

Realizarea și programarea unui circuit ulitizând componente la alegere.

Aici am realizat controlul paletii de culori din ledul RGB cu ajutorul joystick-ului, legaturile sunt la fel ca la aplicatiile anterioare, numai codul este mai complex, mentionez ca pentru acest cod, m-am inspirat de pe internet.



CODUL

```
const int SW_pin = 7;
const int X_pin = A0;
const int Y_pin = A1;
int redPin = 9;
int greenPin = 10;
int bluePin = 11;
int YPIN;
int XPIN;
int SWPIN;

void setup() {
  pinMode(SW_pin, INPUT);
  digitalWrite(SW_pin, HIGH);
  Serial.begin(9600);
  pinMode(redPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
  pinMode(bluePin, OUTPUT);
}
```

```
void setColor(int red, int green, int blue)
{
  analogWrite(redPin, red);
  analogWrite(greenPin, green);
  analogWrite(bluePin, blue);
}

void loop() {
  int YPIN = analogRead(Y_pin);
  int XPIN = analogRead(X_pin);
  int SWPIN = digitalRead(SW_pin);

  Serial.print("Switch:");
  Serial.print(digitalRead(SW_pin));
  Serial.print(" ");
  Serial.print("X-axis:");
  Serial.print(analogRead(X_pin));
  Serial.print(" ");
  Serial.print("Y-axis:");
  Serial.println(analogRead(Y_pin));
  if(YPIN == 0) {setColor(100, 80, 0); delay(100);}
  else {setColor(0, 0, 0);}

  if(YPIN == 1023) {setColor(225, 0, 225); delay(100);}
  else {setColor(0, 0, 0);}

  if(XPIN == 0) {setColor(0, 0, 225); delay(100);}
  else {setColor(0, 0, 0);}

  if(XPIN == 1023) {setColor(0, 225, 0); delay(100);}
  else {setColor(0, 0, 0);}

  if(SWPIN == LOW) {setColor(80, 20, 0); delay(100);}
  else {setColor(0, 0, 0);}
}
```


BONUS

Realizarea și programarea unui circuit utilizând componente la alegere.

Aici am realizat controlul culorilor primare ale ledului RGB cu ajutorul a trei push-butoane individuale, la actionarea acestora se comuta pe inchis iar culoarea aferenta se aprinde in functie de push-butonul apasat.

```
int buton1 = 3;
int buton2 = 4;
int buton3 = 5;
int val_buton1;
int val_buton2;
int val_buton3;
int red= 9;
int green= 10;
int blue= 11;
```

```
void setup() {
  pinMode(buton1,INPUT);
  pinMode(buton2,INPUT);
  pinMode(buton3,INPUT);
  pinMode(red,OUTPUT);
  pinMode(green,OUTPUT);
  pinMode(blue,OUTPUT);
  Serial.begin(9600);
}
```

```
void loop() {
  val_buton1 = digitalRead(buton1);
  if(val_buton1 == HIGH){
    digitalWrite(red, HIGH);
    digitalWrite(green, LOW);
    digitalWrite(blue, LOW);
  }
  else{
    digitalWrite(red, LOW);
    digitalWrite(green, HIGH);
    digitalWrite(blue, HIGH);
    delay(500);
  }

  val_buton2 = digitalRead(buton2);
  if(val_buton2 == HIGH){
    digitalWrite(red, LOW);
    digitalWrite(green, HIGH);
    digitalWrite(blue, LOW);
  }
  else{
    digitalWrite(red, HIGH);
    digitalWrite(green, LOW);
    digitalWrite(blue, HIGH);
    delay(500);
  }

  val_buton3 = digitalRead(buton3);
  if(val_buton3 == HIGH){
    digitalWrite(red, LOW);
    digitalWrite(green, LOW);
    digitalWrite(blue, HIGH);
  }
  else{
    digitalWrite(red, HIGH);
    digitalWrite(green, HIGH);
    digitalWrite(blue, LOW);
    delay(500);
  }
}
```

