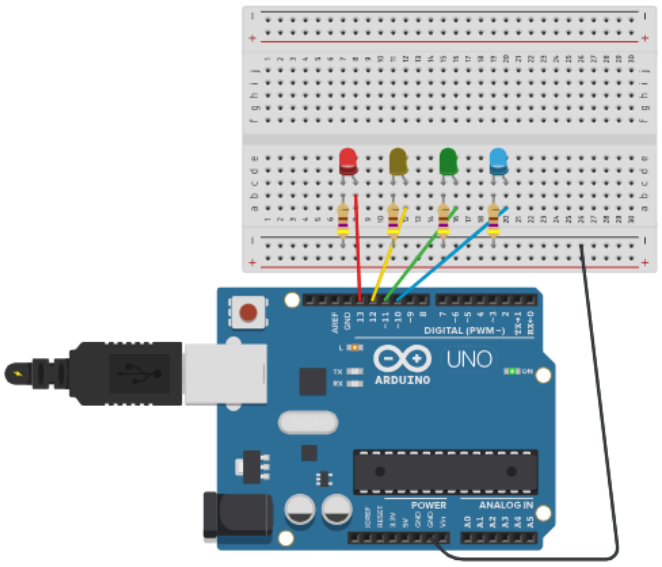
Pontifícia Universidade Católica de Minas Gerais
Aluna: Rayssa Mell de Souza Silva

Exercício Prático 03

Exercício 1 => Semáforo Temporizado

Montagem:



Programa:

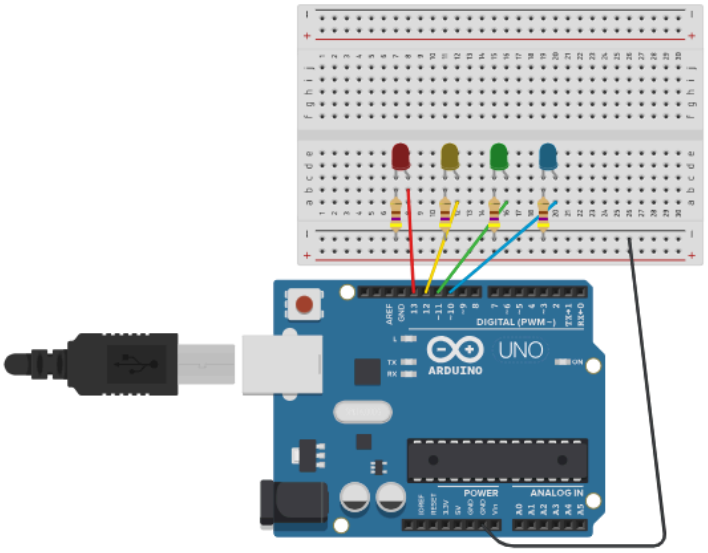
```
//declaracoes
int ledR = 13; //red
int ledY = 12; //yellow
int ledG = 11; //green
int ledB = 10; //blue
int cont = 0;

void setup() {
        Serial.begin(9600);
        pinMode(ledR,OUTPUT);
        pinMode(ledY,OUTPUT);
        pinMode(ledG,OUTPUT);
        pinMode(ledB,OUTPUT);
}

void loop() {
         // 9 ciclos - indicado pelo led azul
        while(cont < 10){
```

```
                //liga azul
                digitalWrite (ledB, HIGH);
                semaforo(cont);
                digitalWrite (ledB, LOW);
                delay(1000); //1 segundo
                cont++; //conta o ciclo
        }
        cont = 0;
}

//funcao para Leds que representam o semaforo
void semaforo(int cont){
        // 3 ciclos para vernelho
        if(cont >= 0 && cont < 3){
                digitalWrite (ledR, HIGH);
                delay(1000);
                digitalWrite (ledR, LOW);
        }
        //4 ciclos para verde
        else if(cont >= 3 && cont < 7){
                digitalWrite (ledG, HIGH);
                delay(1000);
                digitalWrite (ledG, LOW);
        }
        // 2 ciclos para amarelo
        else if(cont < 9){
                digitalWrite (ledY, HIGH);
                delay(1000);
                digitalWrite (ledY, LOW);
        }
}
```

Link do tinkercad:
https://www.tinkercad.com/things/j6VshSI5POq-exercicio03-q01?sharecode=5vDX9YsaTI9hr-lJgJ4j5pp2plqxS_TGDYV4tVrV7CQ

Exercício 2 => Unidade lógica de 1 bit no arduino

Montagem:



Programa:

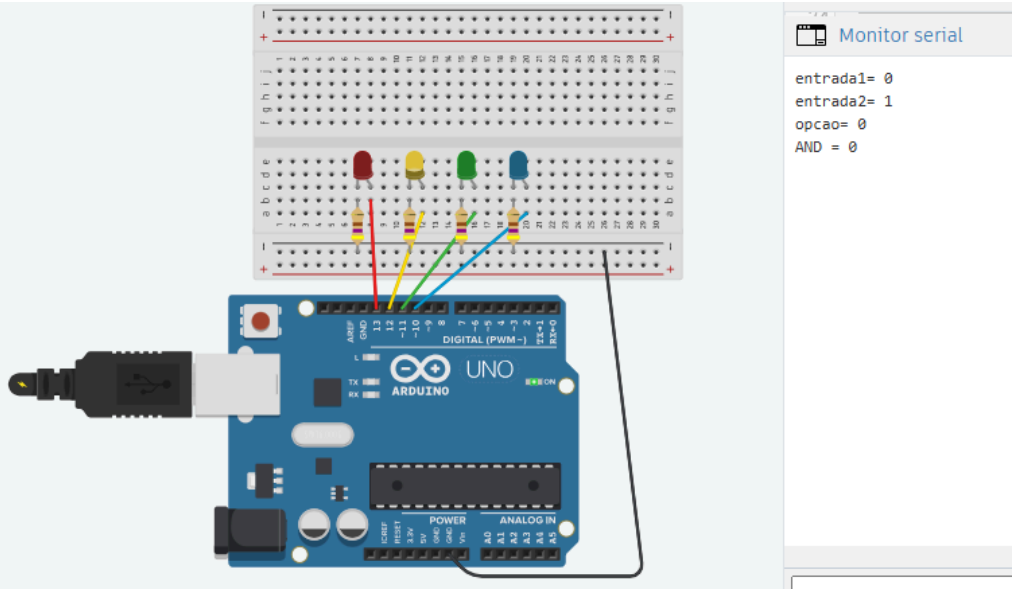
```
//declaracoes
int led1 = 13;
int led2 = 12;
int led3 = 11;
int led4 = 10;

int a = 0;
int b = 0;
int opCode = 0;
int saida = 0;

void setup() {
        Serial.begin(9600);
        pinMode(led1,OUTPUT);
        pinMode(led2,OUTPUT);
        pinMode(led3,OUTPUT);
        pinMode(led4,OUTPUT);
}
void loop() {
   if (Serial.available() > 0) {
      String input = Serial.readStringUntil('\n'); //le a entrada como string
      a = input.charAt(0) == '1' ? 1 : 0;  // verifica se o primeiro caractere é '1' ou '0'
      b = input.charAt(1) == '1' ? 1 : 0;  // verifica o segundo caractere
      opCode = input.charAt(2) - '0';  //de caractere para digito

      Serial.print("entrada1= ");
      Serial.print(a);
      Serial.println();
```

```
        Serial.print("entrada2= ");
        Serial.print(b);
        Serial.println();
        Serial.print("opcao= ");
        Serial.println(opCode);

        if(opCode == 0) {
          saida = portaand(a, b);
          Serial.print("AND = ");
        }
        else if(opCode == 1) {
          saida = portaor(a, b);
          Serial.print("OR = ");
        }
        else if(opCode == 2) {
          saida = portanot(a);
          Serial.print("NOT entrada1 = ");
        }
        else {
          saida = portaxor(a, b); //soma
          int carry = a & b; //carry out
          Serial.print("SOMA = ");

          // acende o LED azul se houver carry
          if(carry) {
            digitalWrite(led4, HIGH);
          } else {
            digitalWrite(led4, LOW);
          }
        }

        Serial.print(saida);
        Serial.println();
        mostra(a, b, saida);
    }
}

int portaxor(int a, int b)
{
  return(a^b);
}

int portaor(int a, int b)
{
  return(a|b);
}

int portaand(int a, int b)
```

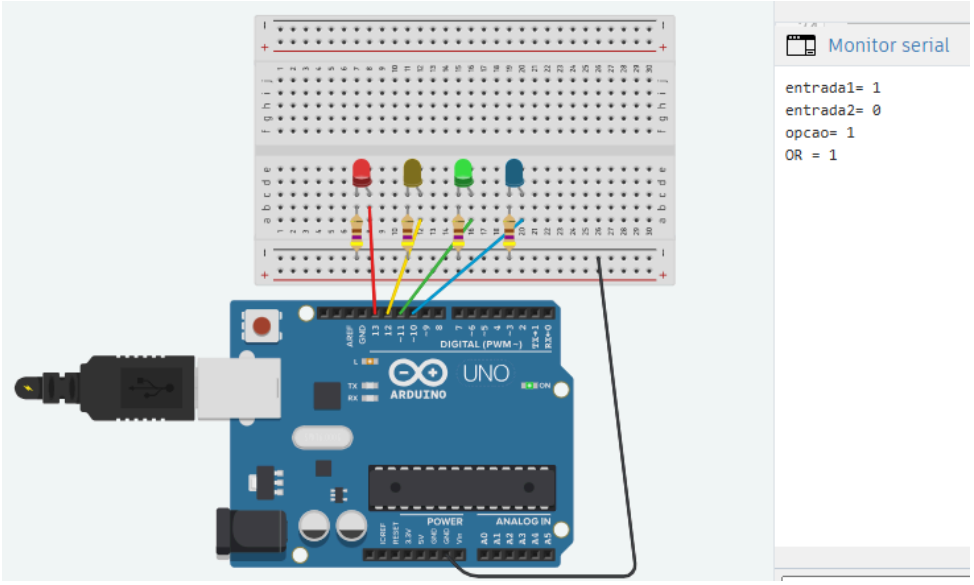
```
{
  return(a&b);
}

int portanot(int a)
{
  return(~a & 1);
}

void mostra(int a, int b, int saida) {
  // acende o LED de entrada a - vermelho
  if (a == 1) digitalWrite(led1, HIGH);
  else digitalWrite(led1, LOW);

  // acende o LED de entrada b - amarelo
  if (b == 1) digitalWrite(led2, HIGH);
  else digitalWrite(led2, LOW);

  // Acende o LED de resultado - verde
  if (saida == 1) digitalWrite(led3, HIGH);
  else digitalWrite(led3, LOW);
}
```

Instrução:

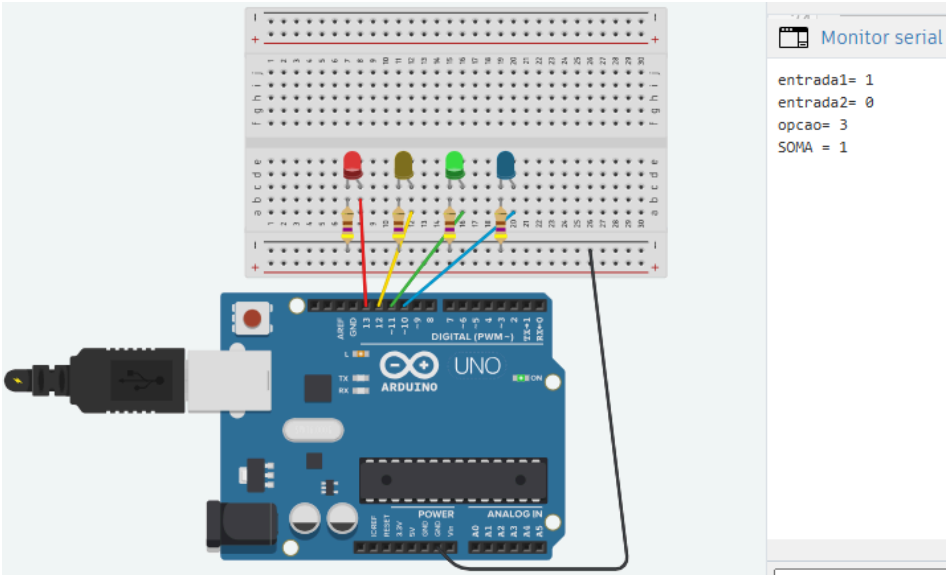
AND(A,B)



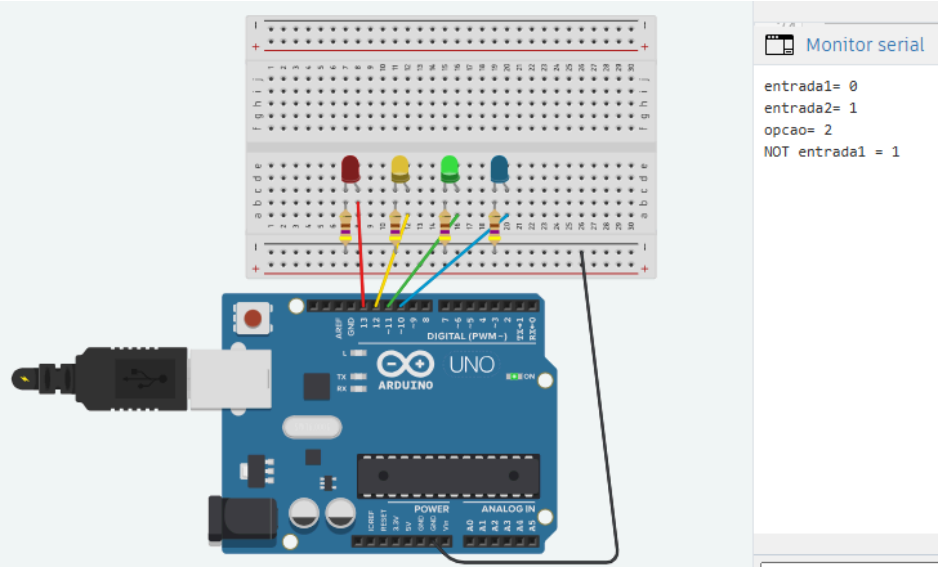
OR(A,B)


Monitor serial
entrada1= 1
entrada2= 0
opcao= 1
OR = 1

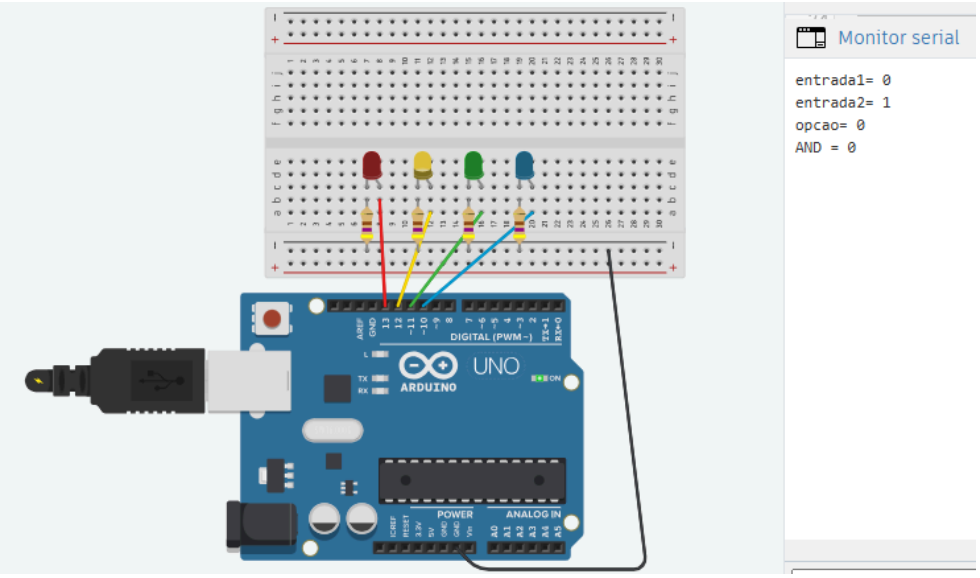
SOMA(A,B)


Monitor serial
entrada1= 1
entrada2= 0
opcao= 3
SOMA = 1

NOT(A)



AND(B,A)



Instrução Realizada	Binário (A,B, OP.Code)	Valor em HEXA	Resultado em Binário
AND(A,B)	0 1 00	0x4	0
OR(A,B)	1 0 01	0x9	1
SOMA(A,B)	1 0 11	0xB	1
NOT(A)	0 0 10	0x2	1
AND(B,A)	0 1 00	0x4	0

PUC Minas

Link do tinkercad:
https://www.tinkercad.com/things/4vdTtCpyWaO-exercicio03-q02?sharecode=Lge5u1jZdr-QLe1hfH8s6YZobOpmOo1PPZbIlP0FnV0