Parte 1

Exercicio 1

Codigo Arduino - Tinkercad

```
int counter;
int counter2;
int counter3;

void setup()
{
  pinMode(10, OUTPUT);          //led azul
  pinMode(11, OUTPUT);          //led verde
  pinMode(12, OUTPUT);          //led amarelo
  pinMode(13, OUTPUT);          //led vermelho
}

void loop()
{
  for (counter = 0; counter < 3; ++counter) {
    digitalWrite(10, HIGH);
    digitalWrite(13, HIGH);
    delay(1000);
    digitalWrite(10, LOW);
    delay(1000);
  }
  digitalWrite(13, LOW);
  for (counter2 = 0; counter2 < 4; ++counter2) {
    digitalWrite(10, HIGH);
    digitalWrite(11, HIGH);
    delay(1000);
    digitalWrite(10, LOW);
    delay(1000);
  }
  digitalWrite(11, LOW);
  for (counter3 = 0; counter3 < 2; ++counter3) {
    digitalWrite(10, HIGH);
    digitalWrite(12, HIGH);
    delay(1000);
    digitalWrite(10, LOW);
    delay(1000);
  }
  digitalWrite(12, LOW);
}
```

Exercicio 2

Codigo Arduino - Tinkercad

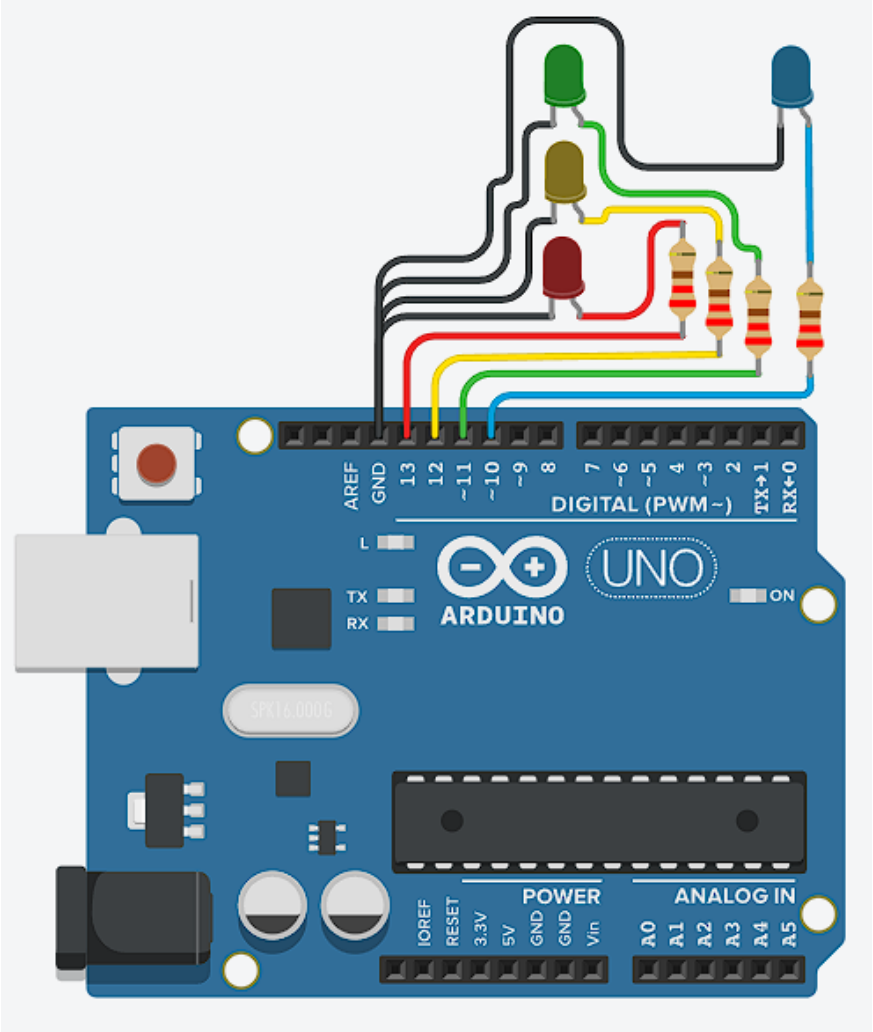
```
int entradaA = 0;
int entradaB = 0;
int ledA = 13;
int ledB = 12;
int ledUla = 11;
int ledVai1 = 10;
int OP0 = 0;
int OP1 = 0;
int vai1 = 0;

void setup() {
   Serial.begin(9600);
   pinMode(ledUla,OUTPUT);
   pinMode(ledVai1,OUTPUT);
   pinMode(ledA,OUTPUT);
   pinMode(ledB,OUTPUT);
}

void loop() {
    if (Serial.available() > 0) {
      entradaA = Serial.parseInt();
      entradaB = Serial.parseInt();
      OP1 = Serial.parseInt();
      OP0 = Serial.parseInt();

        Serial.print("----------------");
        Serial.print("Entrada A = ");
        Serial.print(entradaA);
        Serial.println();
        Serial.print("Entrada B = ");
        Serial.print(entradaB);
        Serial.println();
        Serial.print("Entrada OP = ");
        Serial.print(OP0);
        Serial.print(OP0);
        Serial.println();
        Serial.print("Carry In = ");
        Serial.print(vai1);
        Serial.println();

        mostra(ledA, entradaA);
        mostra(ledB, entradaB);

      if ( (OP1 == 0) && (OP0 == 0) ){
          mostra(ledUla, portaand(entradaA,
          entradaB));
      }else if ((OP1 == 0) && (OP0 == 1)) {
          mostra(ledUla, portaor(entradaA,
          entradaB));
      }else if ((OP1 == 1) && (OP0 == 0)) {
          mostra(ledUla, portanot(entradaA));
      }else if ((OP1 == 1) && (OP0 == 1)){
          mostra(ledUla, soma(entradaA, entradaB));
          vai1 = carry(entradaA, entradaB);
      mostra(ledVai1, vai1);
        }
    }
}

   int soma (int a, int b)
{
  if( (a == 1) && (b == 1) ) {
        return 0;
  } else if ( ((a == 1) && (b == 0)) || ((a == 0)
&& (b == 1)) ) {
        return 1;
  } else {
        return 0;
  }
}

int carry (int a, int b) {
   if( (a == 1) && (b == 1) ) {
        return 1;
  } else {
        return 0;
  }
}

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

int portaand(int a, int b)
{
  return(a&b);
}

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

int mostra (int pin, int a)
{
  if (a == 1)
    digitalWrite(pin,1);
    else digitalWrite(pin,0);
}
```

Tabela de Resultados

Instruções Realizadas	Binário (A, B, Op.code)	Valor em Hexa (0x…)	Resultado em Binário
AND(A,B)	0 1 00	(0 1 00) = 0x4	00
OR(A,B)	1 0 01	(1 0 01) = 0x9	01
SOMA(A,B)	1 0 11	(1 0 11) = 0xb	01
NOT(A)	0 0 10	(0 0 10) = 0x2	01
AND(B,A)	1 1 00	(1 1 00) = 0xc	01

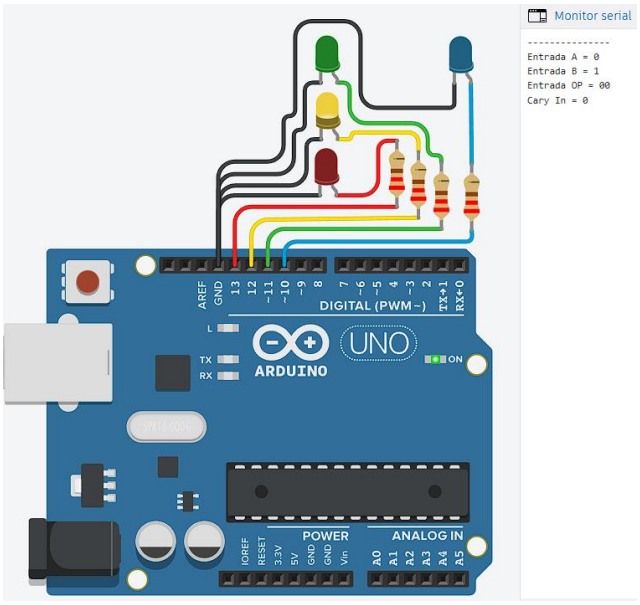
Circuito Arduino - Tinkercad

O circuito abaixo aprecenta o modelo usado tanto para o exercício 1, quanto para o exercício 2, apenas foi alterado sou codigo interno.

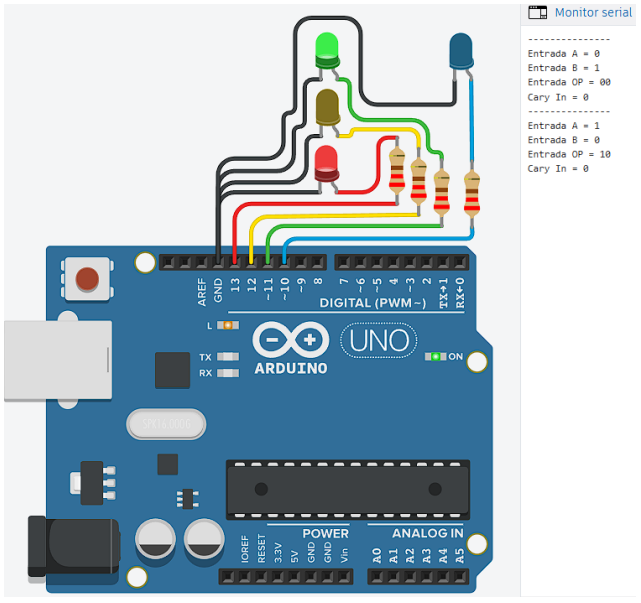


Testes Realizados

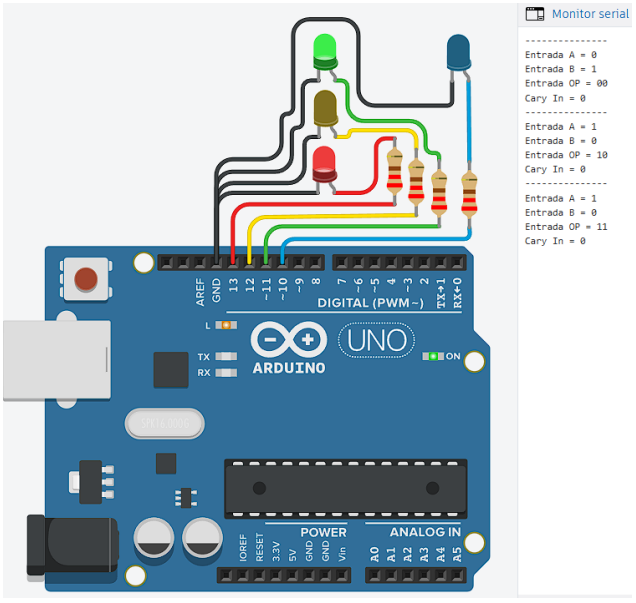
A = 0 | B = 1 | OP.code = 00



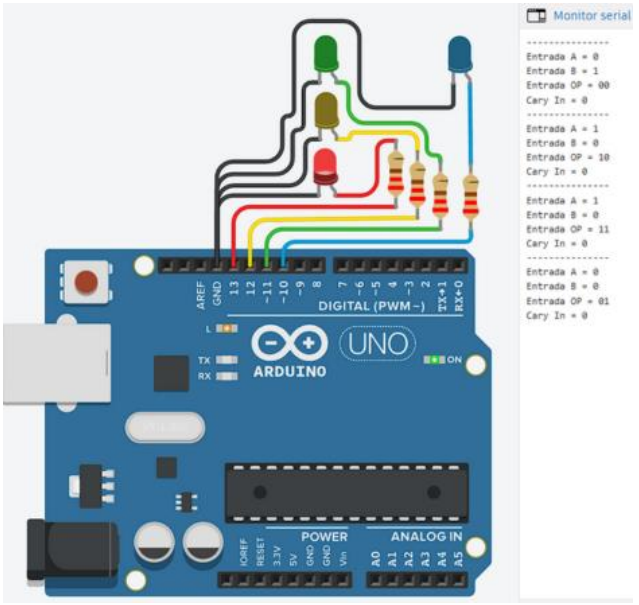
A = 1 | B = 0 | OP.code = 01



A = 1 | B = 0 | OP.code = 11



A = 0 | B = 0 | OP.code = 10



A = 1 | B = 1 | OP.code = 00