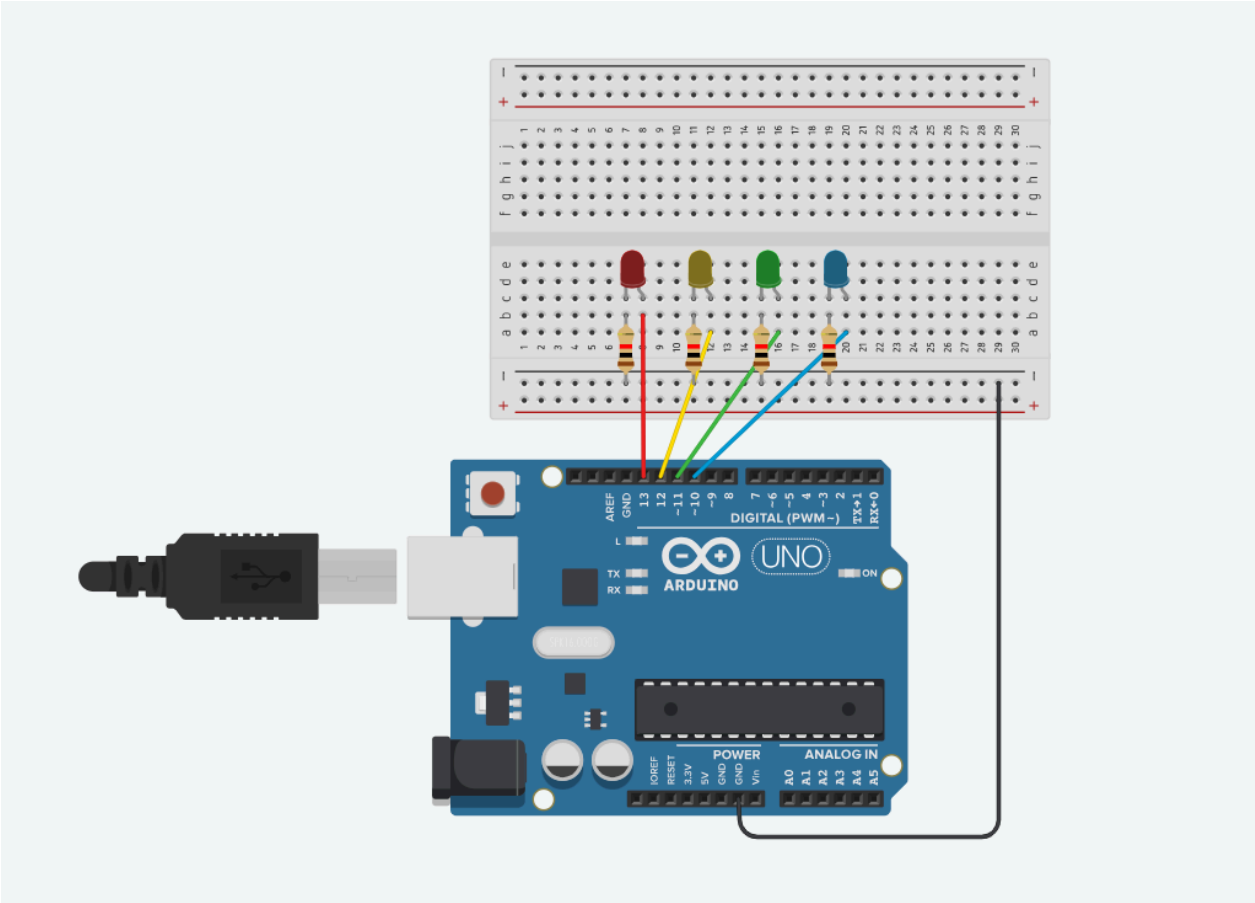
Arquitetura de Computadores 2

Exercício Prático 03

793605– Caio Faria Diniz

Exercício 1:

Circuito



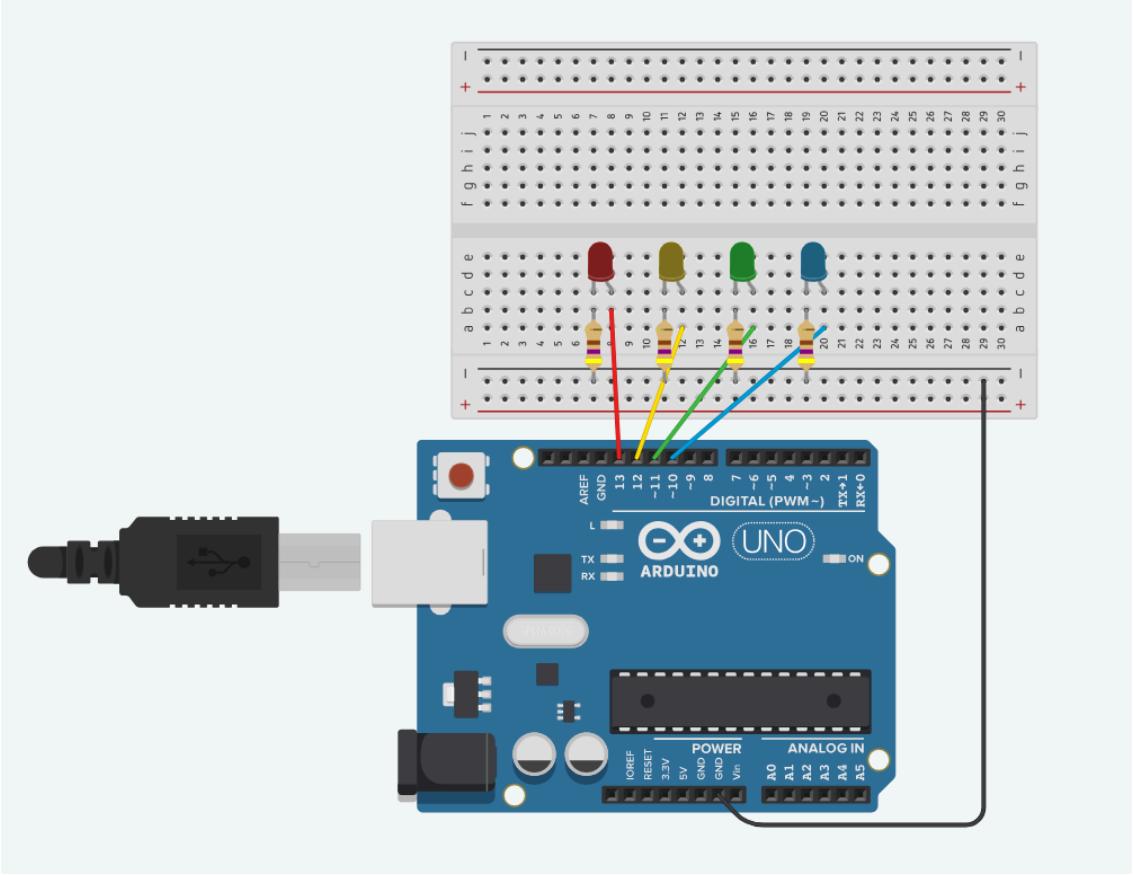
Programa:

```
// Definir os pinos
int BlueLed   = 10;
int GreenLed  = 11;
int YellowLed = 12;
int RedLed    = 13;

// Definir as variaveis
const int time = 1000;
const int ClkRed = 3;
const int CLKGreen = 4;
const int CLKYellow = 2;

void turnoff( int led );
void turon ( int led );

void setup (){
  pinMode ( BlueLed , OUTPUT );
  pinMode ( GreenLed , OUTPUT );
  pinMode ( YellowLed , OUTPUT);
  pinMode ( RedLed , OUTPUT );
}

void loop (){
  for (int i = 0; i < CLKRed; i++){
    turnon (BlueLed);
    turnon (RedLed);
    delay(time);
    turnoff(BlueLed);
    delay(time);
  }//end for red
  turnoff(RedLed);

   for (int i = 0; i < CLKGreen; i++){
    turnon (BlueLed);
    turnon (GreenLed);
    delay(time);
    turnoff(BlueLed);
    delay(time);
  }// end for green
  turnoff(GreenLed);

   for (int i = 0; i < CLKYellow; i++){
    turnon (BlueLed);
    turnon (YellowLed);
    delay(time);
    turnoff(BlueLed);
    delay(time);
  }// end for yellow
  turnoff(YellowLed);
}// end loop

void turnoff (int led) {
  digitalWrite(led, LOW);
}

void turnon(int led){
  digitalWrite(led, HIGH);
```

Exercício 2:

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

Circuito:



Programa :

parte01

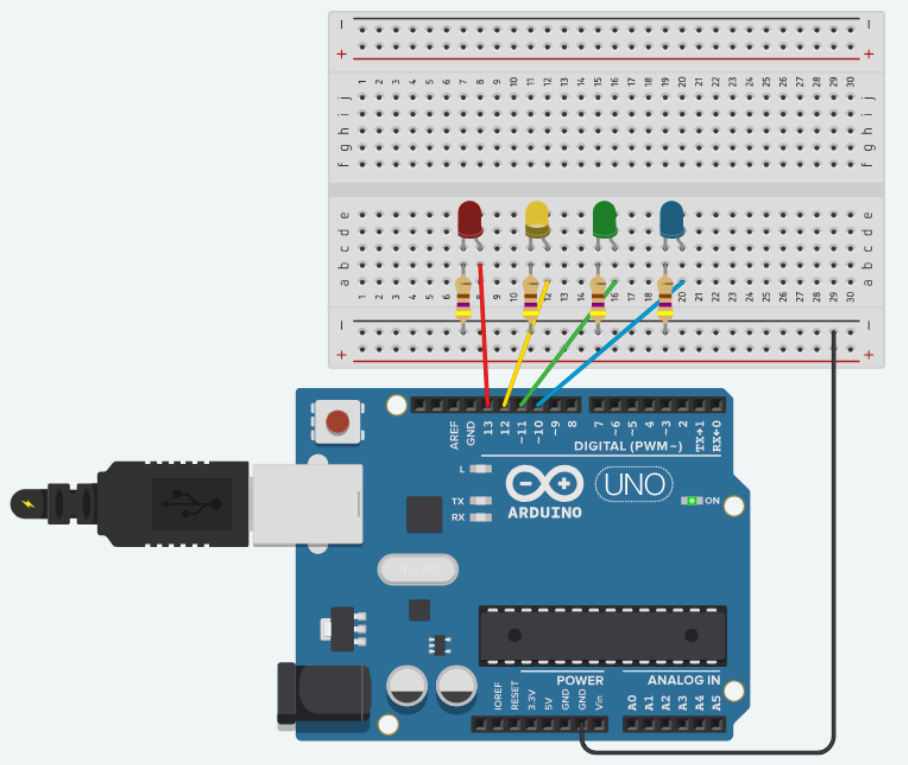
```
// definicao de pinos
int ledA      = 13;
int ledB      = 12;
int ledOutput = 11;
int ledCarry  = 10;

// prototipo de funcoes
char read      ( );
void turnOnOff ( int led, int value );
int  gate_xor  ( int a, int b );
int  gate_or   ( int a, int b );
int  gate_and  ( int a, int b );
int  gate_not  ( int a );

void setup ( )
{
    Serial.begin( 9600 );
    pinMode( ledA , OUTPUT );
    pinMode( ledB , OUTPUT );
    pinMode( ledOutput , OUTPUT );
    pinMode( ledCarry  , OUTPUT );
} // end setup ( )

void loop ( )
{
    if( Serial.available( ) >= 3 ) {
        int a  = read( );
        int b  = read( );
        int op = read( );

        int output = 0;
        int carry  = 0;

        switch ( op ) {
            case 0:
                output = gate_and( a, b );
                break;
            case 1:
                output = gate_or( a, b );
                break;
            case 2:
                output = gate_not( a );
                break;
            case 3:
                output = gate_xor( a, b );
                carry  = gate_and( a, b );
                break;
            default:
                Serial.print( "Operacao Invalida!" );
                break;
        } // end switch

        turnOnOff( ledA , a );
        turnOnOff( ledB , b );
        turnOnOff( ledOutput, output );
        turnOnOff( ledCarry , carry  );
    } // end if
} // end loop ( )

```

Parte 02:

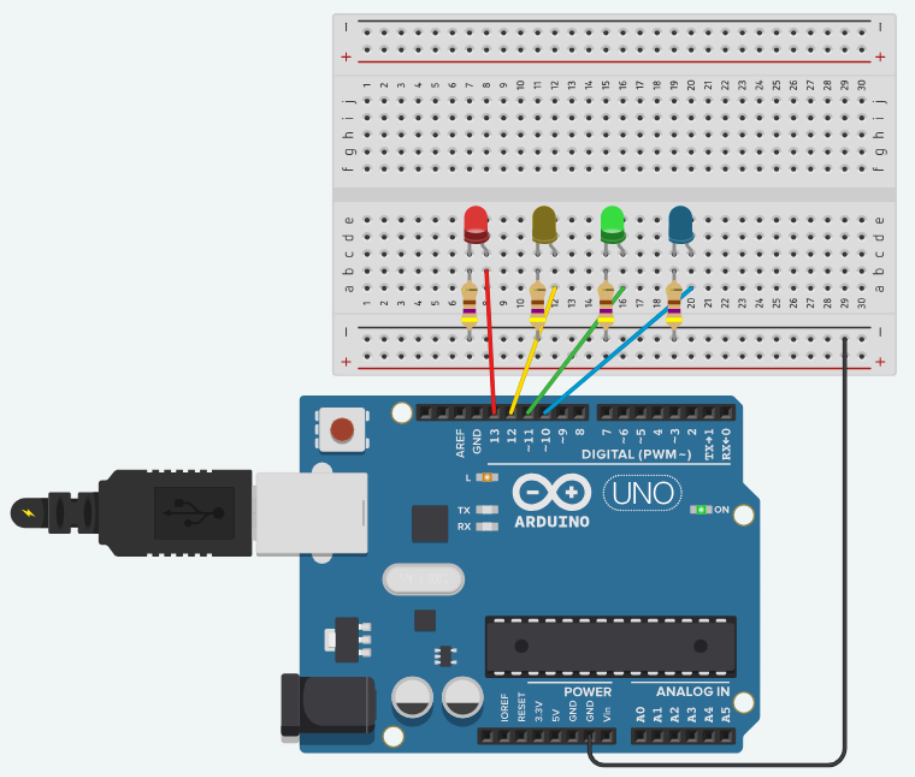
```
60  char read ( ) {
61      return ( Serial.read( ) - '0' );
62  } // end read_int ( )
63
64  void turnOnOff ( int led, int value ) {
65      digitalWrite( led, value );
66  } // end turnOnOff
67
68  int gate_xor ( int a, int b ) {
69      return ( a^b );
70  } // end gate_xor ( )
71
72  int gate_or ( int a, int b ) {
73      return ( a|b );
74  } // end gate_or ( )
75
76  int gate_and ( int a, int b ) {
77      return ( a&b );
78  } // end gate_and ( )
79
80  int gate_not ( int a ) {
81      return ( ~a );
82  } // end gate_not ( )
83
```

Testes:

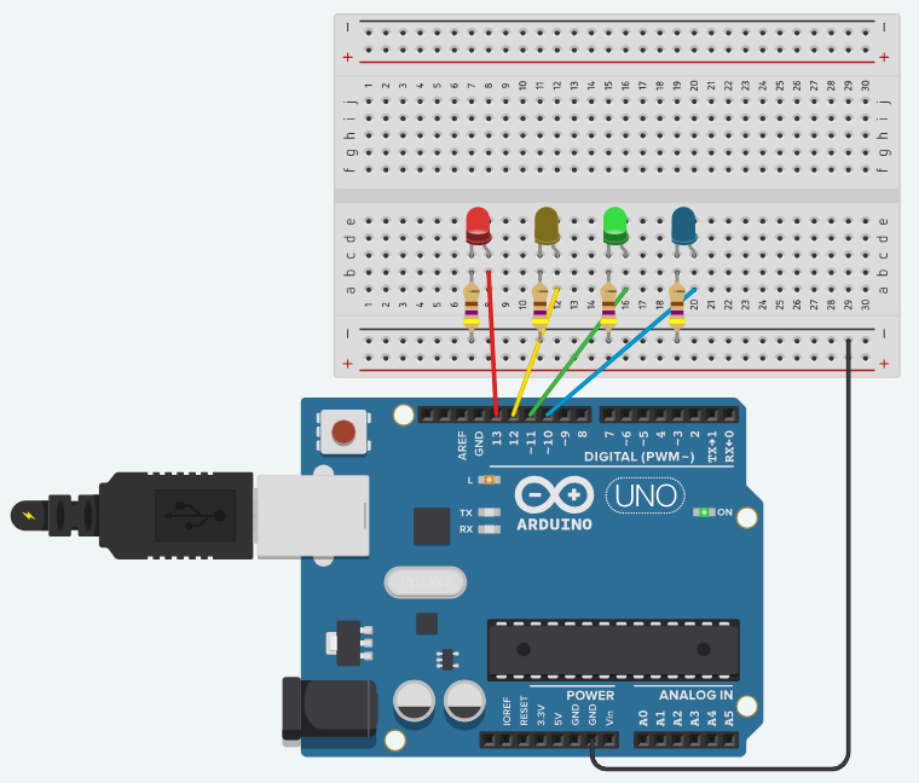
teste 0 1 0:



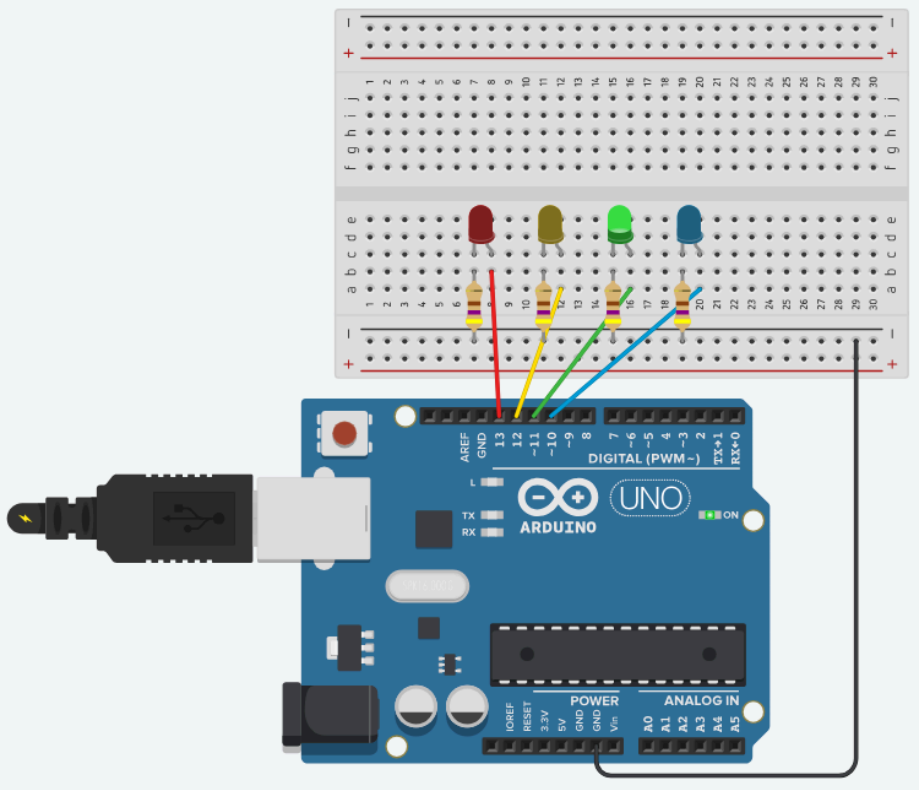
teste 1 0 1:



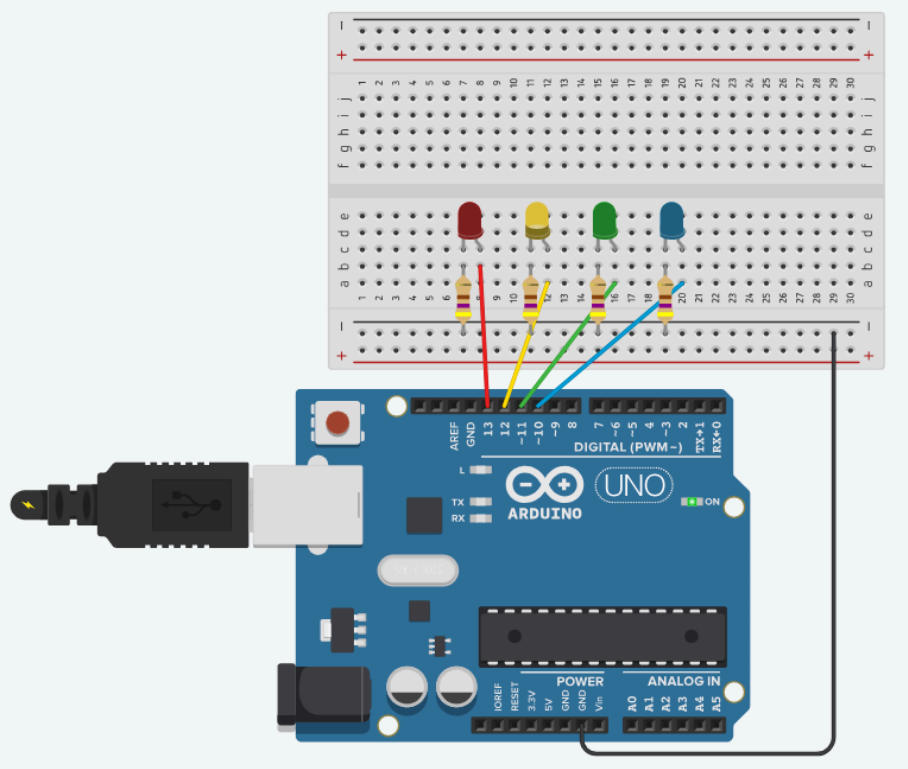
teste 1 0 3:



teste 0 0 2:



teste 1 0 1:



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