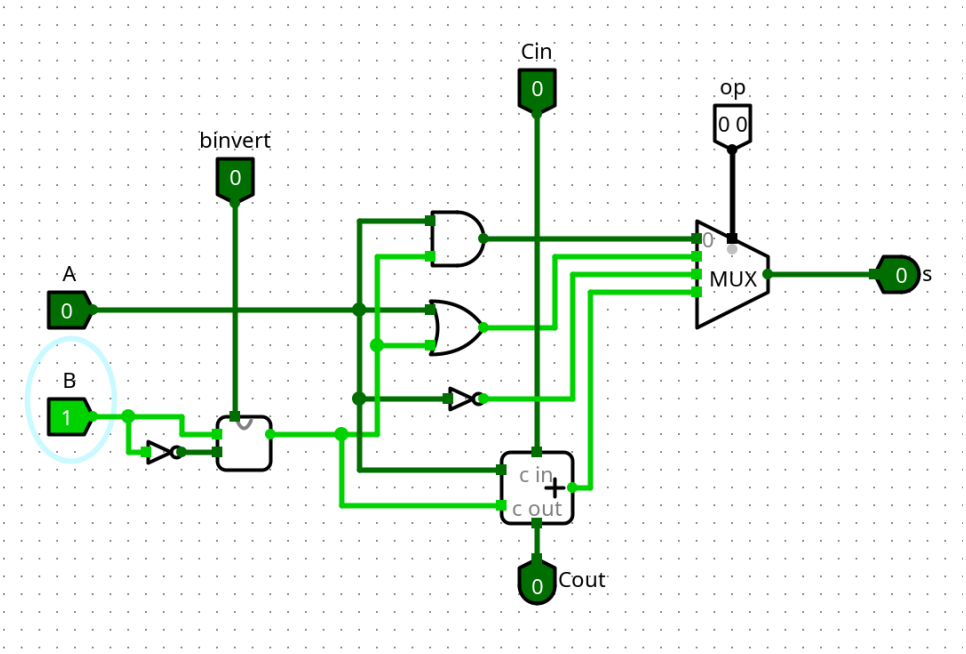
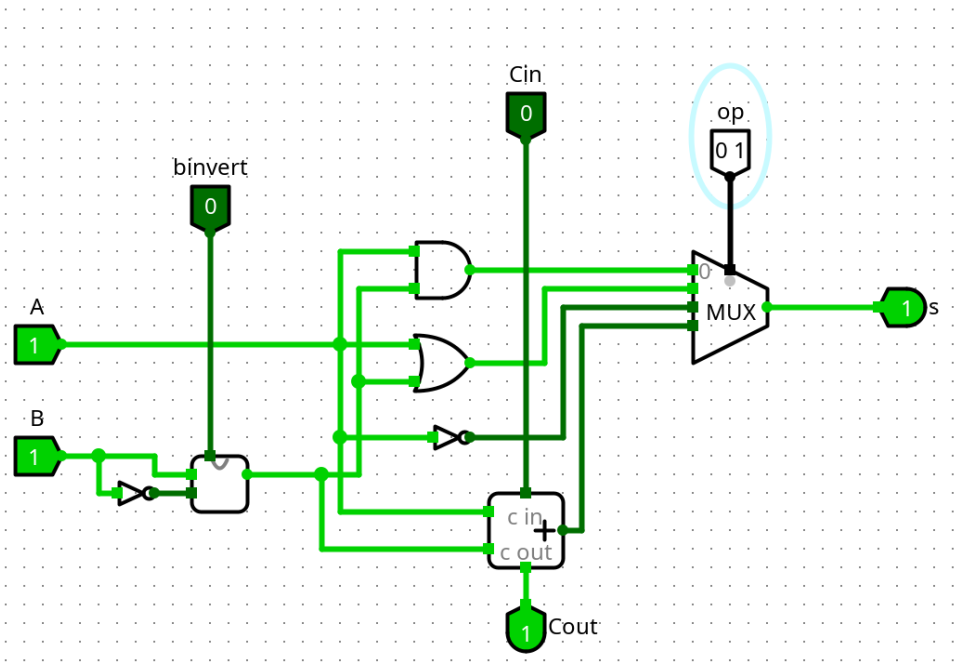
Felipe Augusto Morais Silva

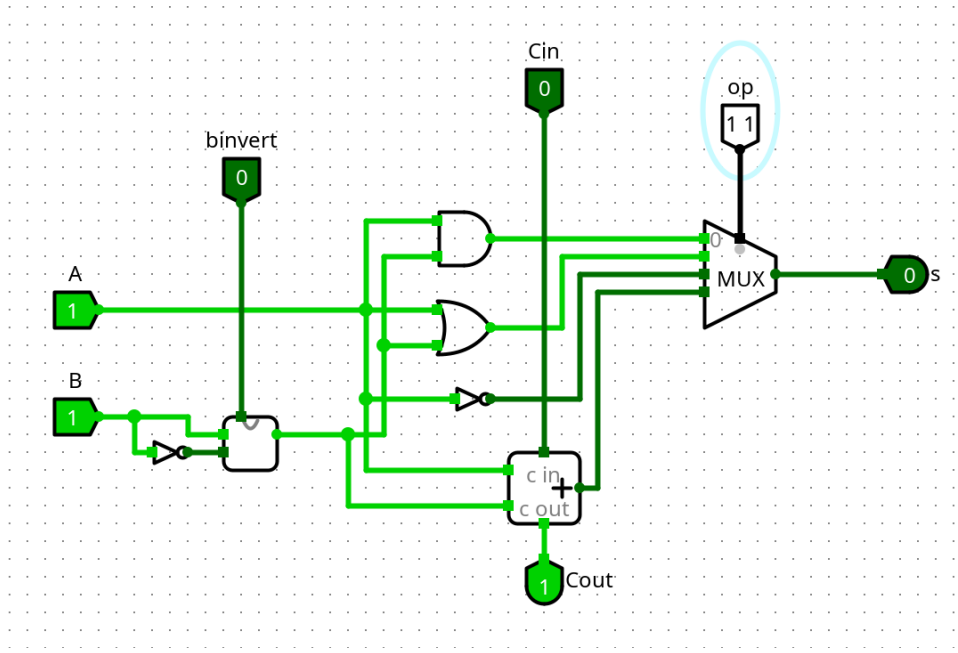
AND(a,b) a = 0, b =1;



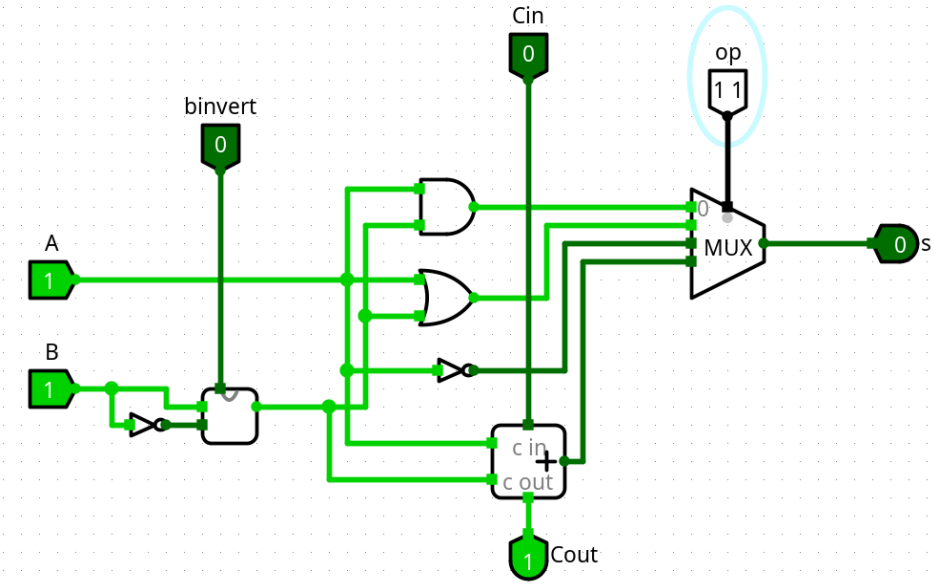
OR(a,b) a = 1, b = 1;



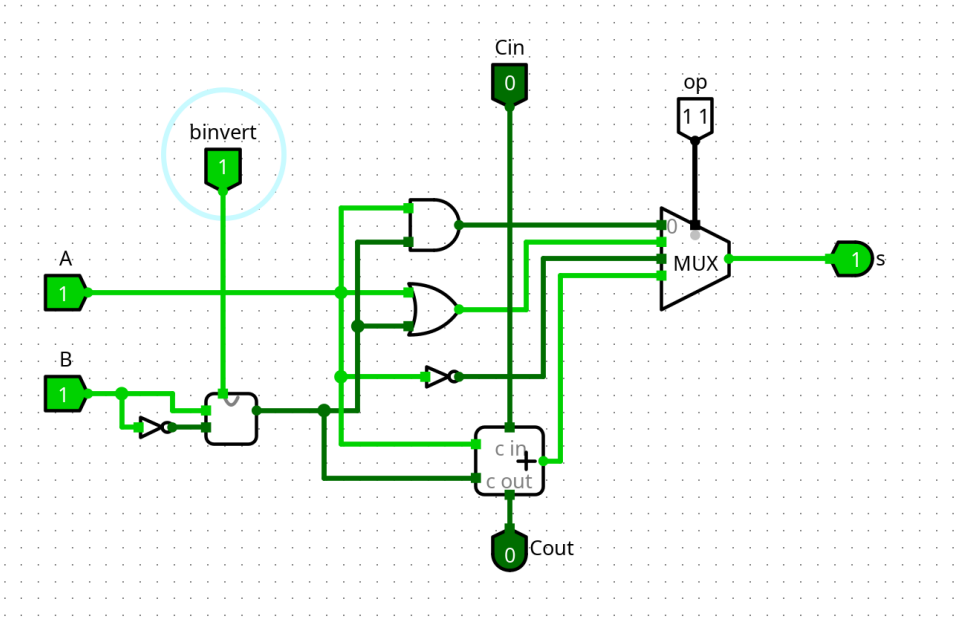
SOMA(a,b)


Cin
0
op
1 1
binvert
0
A
1
B
1
0
MUX
0
s
c in
c out
1
Cout

NOT(A);

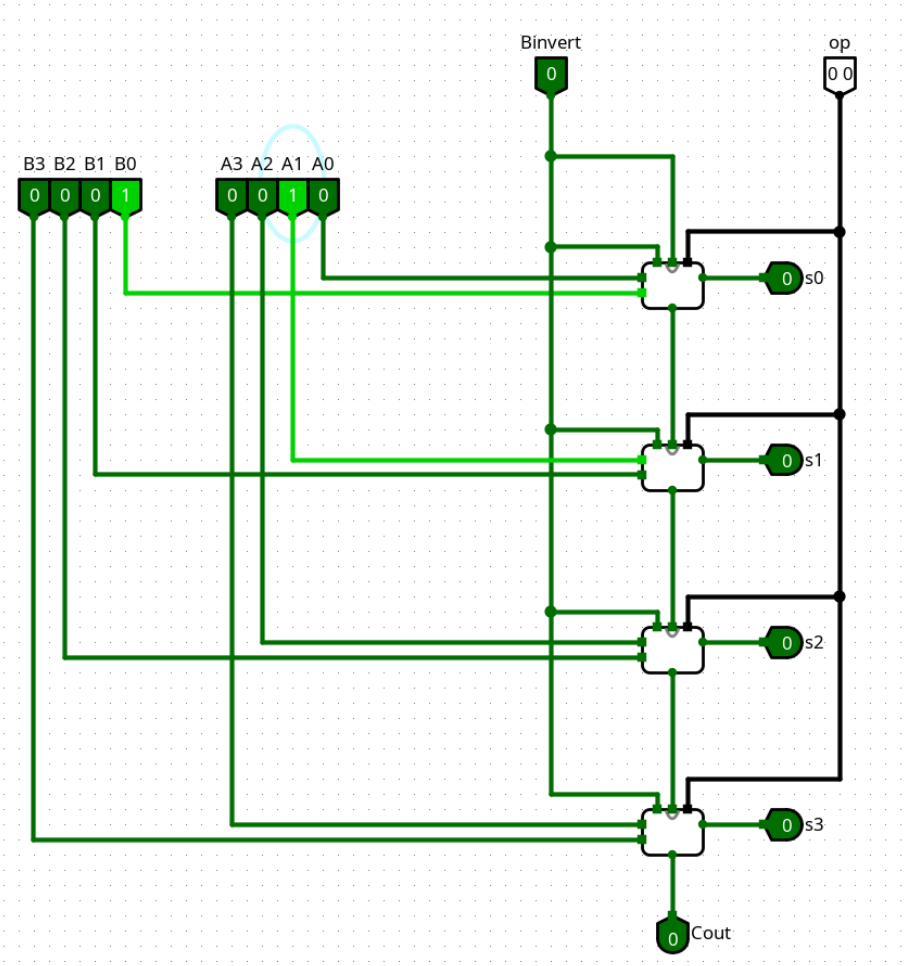

Cin
0
op
1 1
binvert
0
A
1
B
1
0
MUX
0
s
c in
c out
1
Cout

SOMA(A, -B);

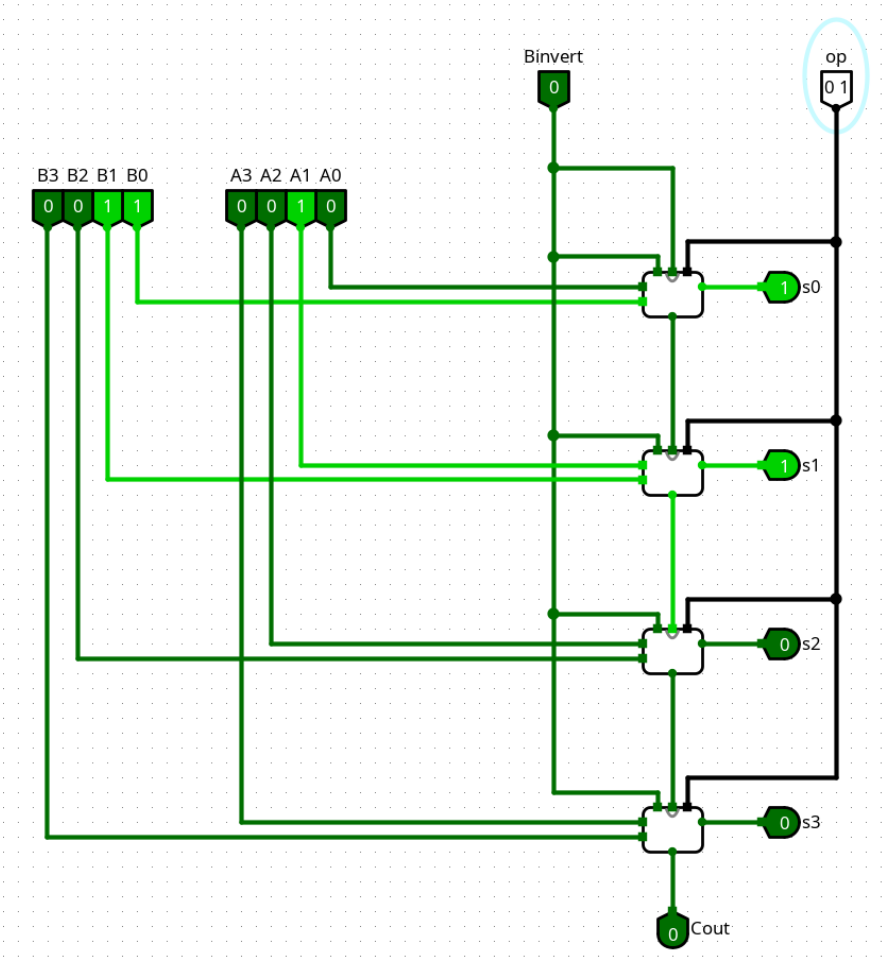


Testes com a ULA de 4 bits:

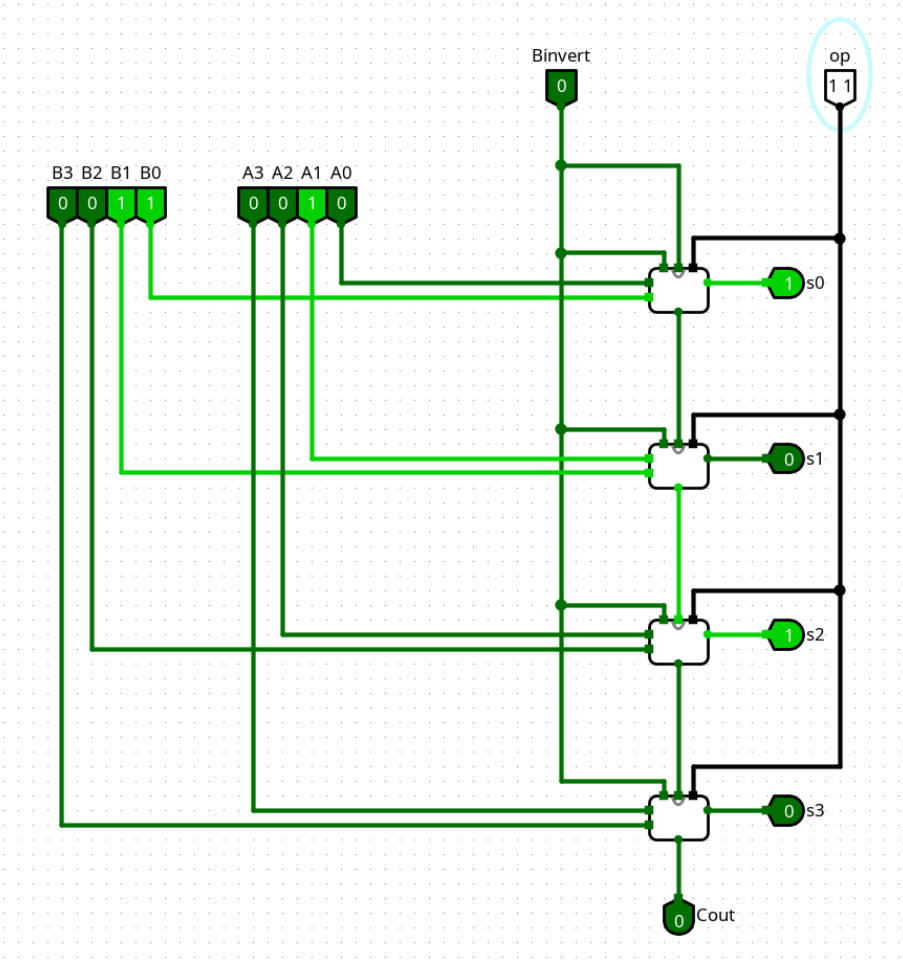
AND(A,B); A = 2, B = 1;


Binvert
0
op
0 0
B3 B2 B1 B0
0 0 0 1
A3 A2 A1 A0
0 0 1 0
0 s0
0 s1
0 s2
0 s3
0 Cout

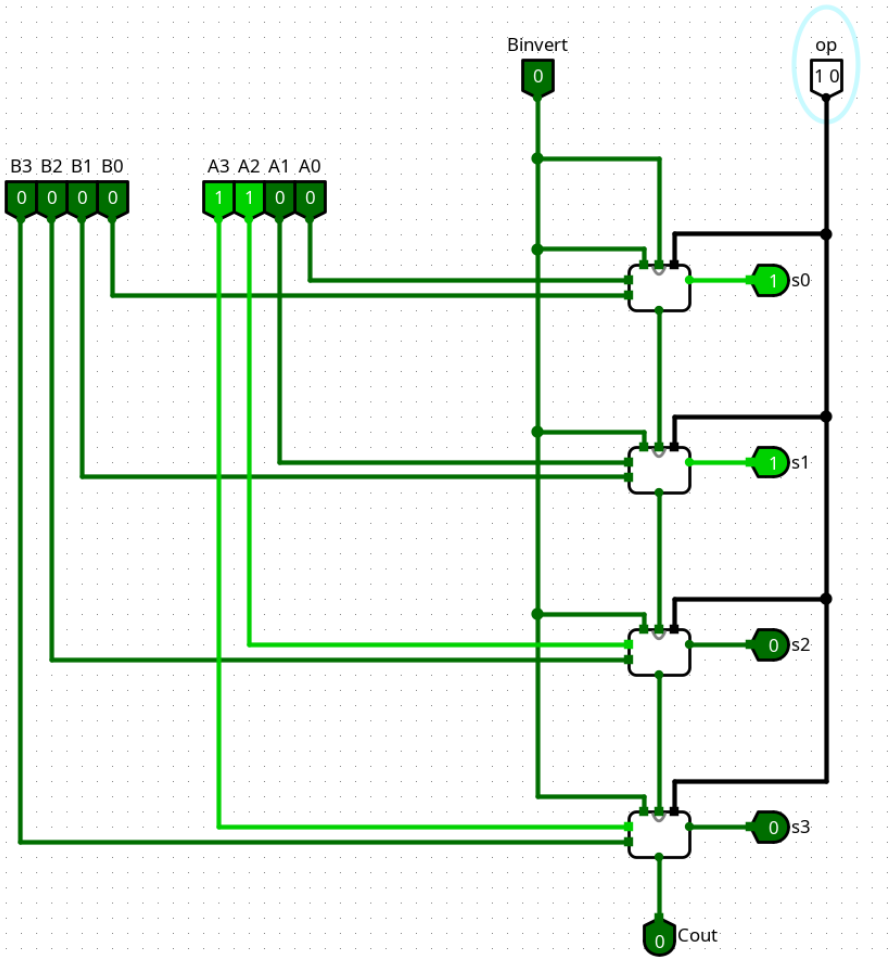
B = 3; OR(A,B);


Binvert
0
op
0 1
B3 B2 B1 B0
0 0 1 1
A3 A2 A1 A0
0 0 1 0
1 s0
1 s1
0 s2
0 s3
0 Cout

SOMA(A,B);


Binvert
0
op
1 1
B3 B2 B1 B0
0 0 1 1
A3 A2 A1 A0
0 0 1 0
1 s0
0 s1
1 s2
0 s3
0 Cout

A = 12; NOT(A)


Binvert
0
op
1 0
B3 B2 B1 B0
0 0 0 0
A3 A2 A1 A0
1 1 0 0
1 s0
1 s1
0 s2
0 s3
0 Cout

B= 13; AND(B,A);

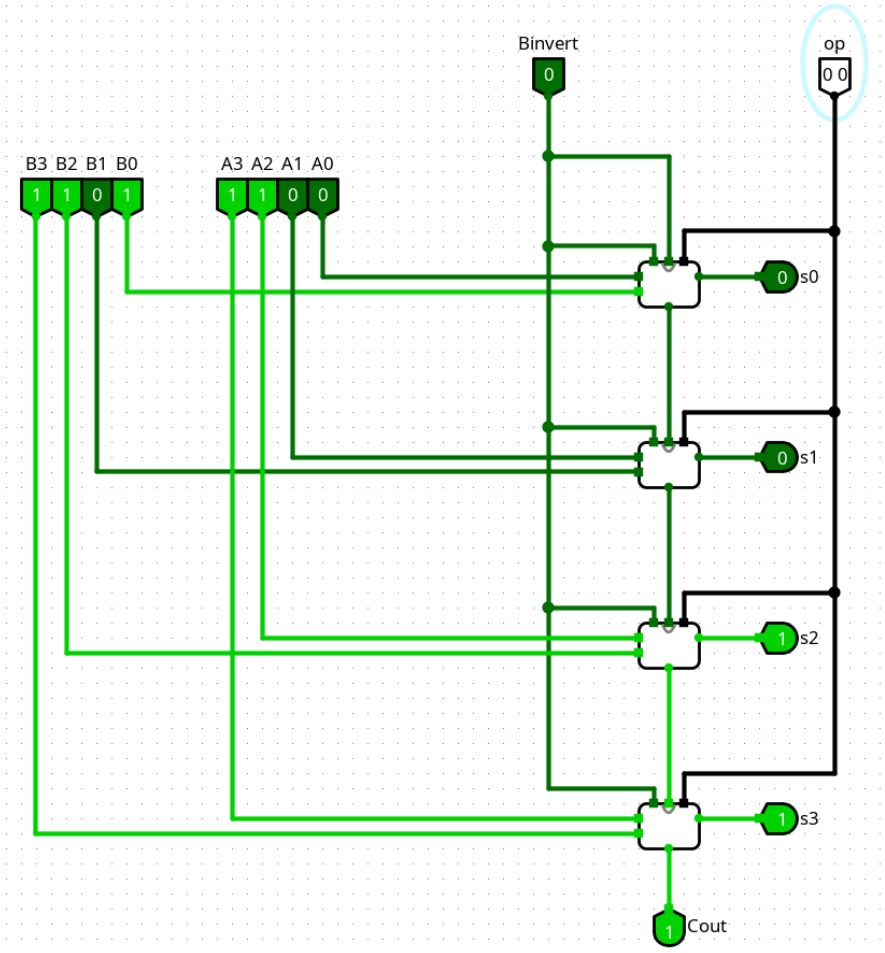


tabela.txt+

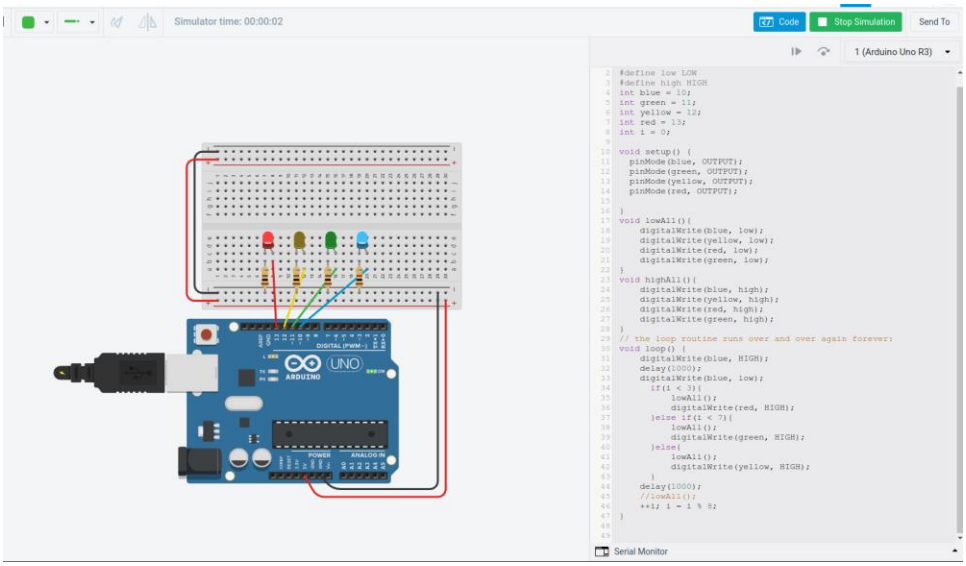
[instr]	[bin]	[Hex]	[ans]
AND(A,B)	0010 0001 00	0x084	0000
OR(A,B)	0010 0011 01	0x08C	0011
SUM(A,B)	0010 0011 11	0x08C	0101
NOT(A,B)	1100 0011 10	0x30E	0011
AND(B,A)	1100 1101 00	0x334	0101

PARTE 2

Ex01:

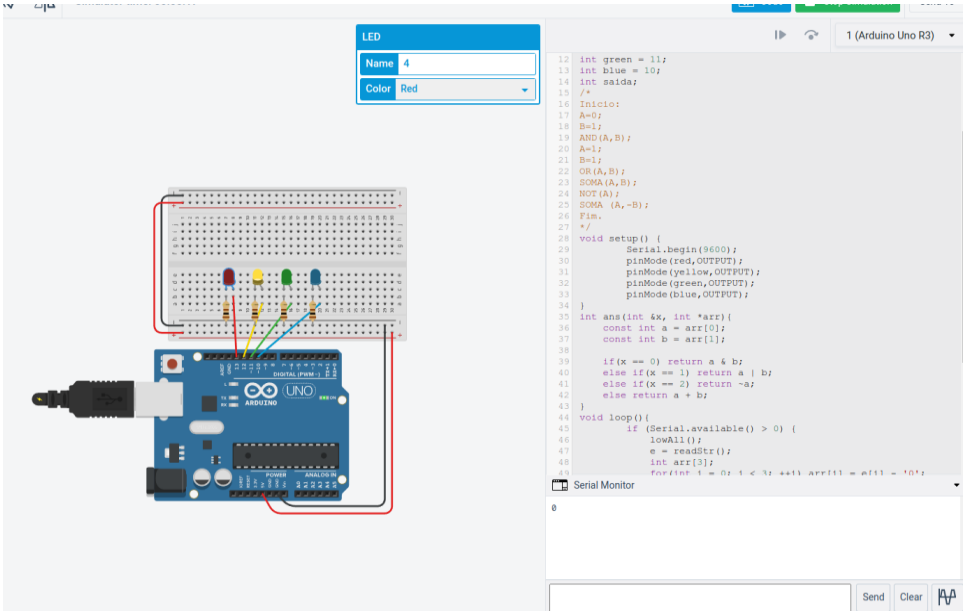
Semáforo funcionando:

(não dá pra tirar print de cada coisa, mas só de vc bater o olho no código já da pra saber q ta funcionando)

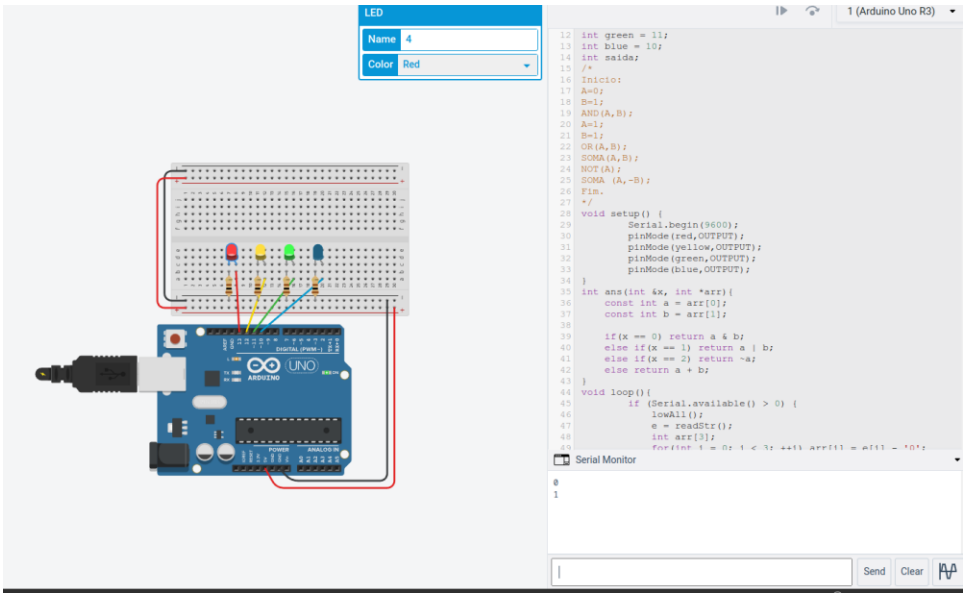

Simulator time: 00:00:02
Code
Stop Simulation
Send To
1 (Arduino Uno R3)
#define low LOW
#define high HIGH
int blue = 10;
int green = 11;
int yellow = 12;
int red = 13;
int i = 0;
void setup() {
pinMode(blue, OUTPUT);
pinMode(green, OUTPUT);
pinMode(yellow, OUTPUT);
pinMode(red, OUTPUT);
}
void lowAll(){
digitalWrite(blue, low);
digitalWrite(yellow, low);
digitalWrite(red, low);
digitalWrite(green, low);
}
void highAll(){
digitalWrite(blue, high);
digitalWrite(yellow, high);
digitalWrite(red, high);
digitalWrite(green, high);
}
// the loop routine runs over and over again forever:
void loop() {
digitalWrite(blue, HIGH);
delay(1000);
digitalWrite(blue, low);
if(i < 3){
lowAll();
digitalWrite(red, HIGH);
}else if(i < 7){
lowAll();
digitalWrite(green, HIGH);
}else{
lowAll();
digitalWrite(yellow, HIGH);
}
delay(1000);
//lowAll();
++i; i = i % 8;
}
Serial Monitor

ex02:

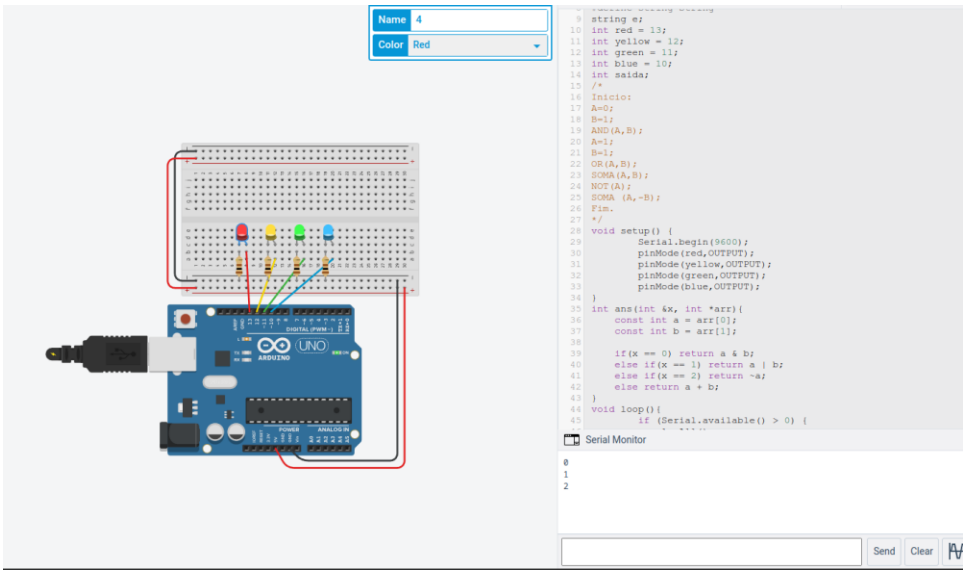
And


LED
Name 4
Color Red
1 (Arduino Uno R3)
int green = 11;
int blue = 10;
int saida;
/*
Inicio:
A=0;
B=1;
AND(A,B);
A=1;
B=1;
OR(A,B);
SOMA(A,B);
NOT(A);
SOMA (A,-B);
Fim.
*/
void setup() {
Serial.begin(9600);
pinMode(red,OUTPUT);
pinMode(yellow,OUTPUT);
pinMode(green,OUTPUT);
pinMode(blue,OUTPUT);
}
int ans(int &x, int *arr){
const int a = arr[0];
const int b = arr[1];
if(x == 0) return a & b;
else if(x == 1) return a | b;
else if(x == 2) return ~a;
else return a + b;
}
void loop(){
if (Serial.available() > 0) {
lowAll();
e = readStr();
int arr[3];
Serial Monitor
0
Send
Clear

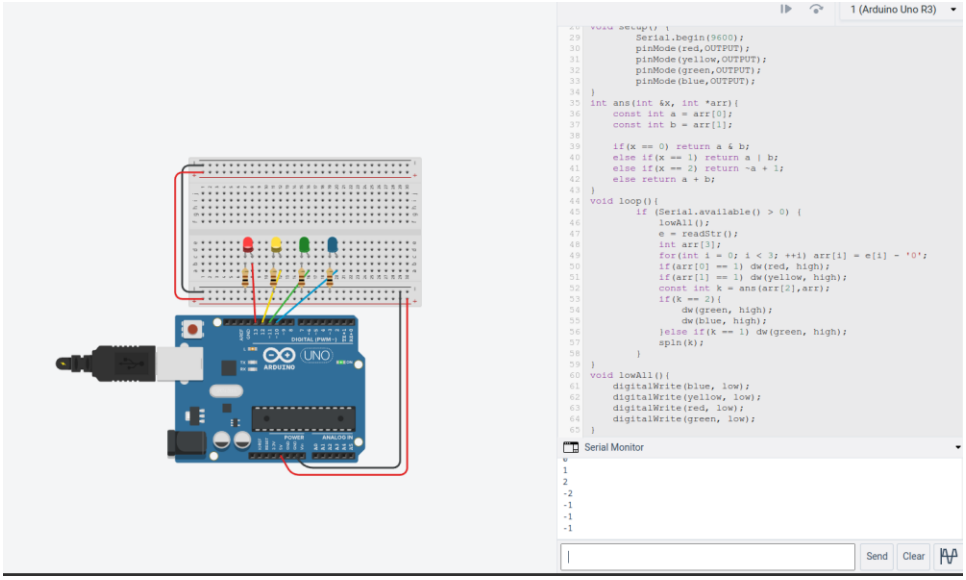
or


LED
Name 4
Color Red
1 (Arduino Uno R3)
int green = 11;
int blue = 10;
int saida;
/*
Inicio:
A=0;
B=1;
AND(A,B);
A=1;
B=1;
OR(A,B);
SOMA(A,B);
NOT(A);
SOMA (A,-B);
Fim.
*/
void setup() {
Serial.begin(9600);
pinMode(red,OUTPUT);
pinMode(yellow,OUTPUT);
pinMode(green,OUTPUT);
pinMode(blue,OUTPUT);
}
int ans(int &x, int *arr){
const int a = arr[0];
const int b = arr[1];
if(x == 0) return a & b;
else if(x == 1) return a | b;
else if(x == 2) return ~a;
else return a + b;
}
void loop(){
if (Serial.available() > 0) {
lowAll();
Serial Monitor
0
1
Send
Clear

Soma


Name 4
Color Red
string e;
int red = 13;
int yellow = 12;
int green = 11;
int blue = 10;
int saida;
/*
Inicio:
A=0;
B=1;
AND(A,B);
A=1;
B=1;
OR(A,B);
SOMA(A,B);
NOT(A);
SOMA (A,-B);
Fim.
*/
void setup() {
Serial.begin(9600);
pinMode(red,OUTPUT);
pinMode(yellow,OUTPUT);
pinMode(green,OUTPUT);
pinMode(blue,OUTPUT);
}
int ans(int &x, int *arr){
const int a = arr[0];
const int b = arr[1];
if(x == 0) return a & b;
else if(x == 1) return a | b;
else if(x == 2) return ~a;
else return a + b;
}
void loop(){
if (Serial.available() > 0) {
Serial Monitor
0
1
2
Send
Clear

Not



codigo

```
a.ino+
#define dw digitalWrite
#define sp Serial.print
#define spln Serial.println
#define spi Serial.parseInt
#define readStr Serial.readString
#define string String
string e;
int red = 13;
int yellow = 12;
int green = 11;
int blue = 10;
int saida;
void setup() {
        Serial.begin(9600);
        pinMode(red,OUTPUT);
        pinMode(yellow,OUTPUT);
        pinMode(green,OUTPUT);
        pinMode(blue,OUTPUT);
}
int ans(int &x, int *arr){
    const int a = arr[0];
    const int b = arr[1];

    if(x == 0) return a & b;
    else if(x == 1) return a | b;
    else if(x == 2){
      if(a == 0) dw(green,high);
      return ~a;
    }
    else return a + b;
}
void loop(){
        if (Serial.available() > 0) {
            lowAll();
            e = readStr();
            int arr[3];
            for(int i = 0; i < 3; ++i) arr[i] = e[i] - '0';
            if(arr[0] == 1) dw(red, high);
            if(arr[1] == 1) dw(yellow, high);
            const int k = ans(arr[2],arr);
            if(k == 2){
                dw(green, high);
                dw(blue, high);
            }else if(k == 1) dw(green, high);
            spln(k);
        }
}
void lowAll(){
    digitalWrite(blue, low);
    digitalWrite(yellow, low);
    digitalWrite(red, low);
    digitalWrite(green, low);
}
NORMAL  a.ino[+]
```