Exercício Pratico 02

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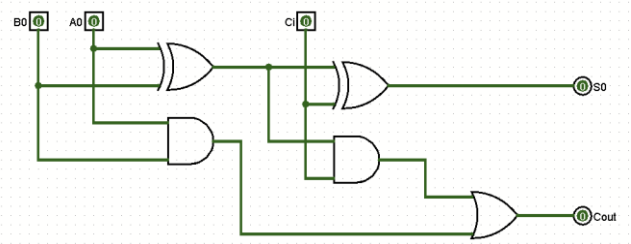
Matrícula: 761670

Objetivo: Cosntruir uma Unidade Lógica e Aritmética (ULA) de 1 bit, 4 bits e implementar no Logisim e Arduino.

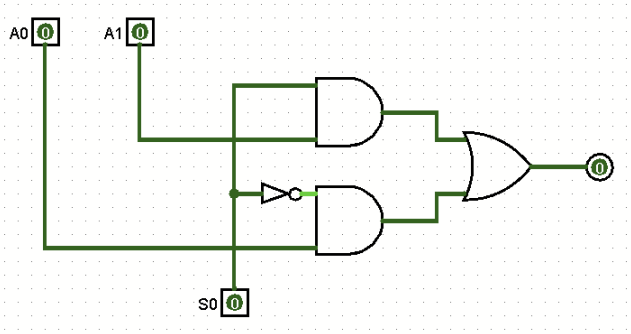
Obs: Logisim 2.7.1 + Logisim 2_15_0_2 (ULA 74LS181)

Parte 1

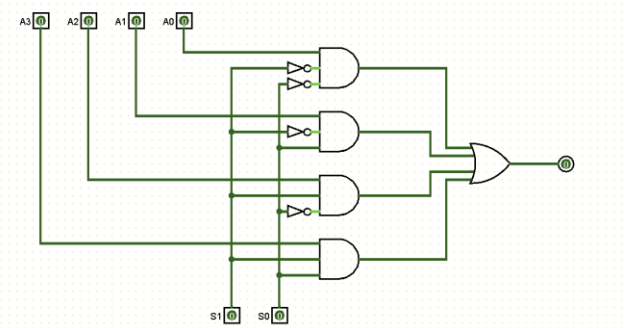
Somador Completo:



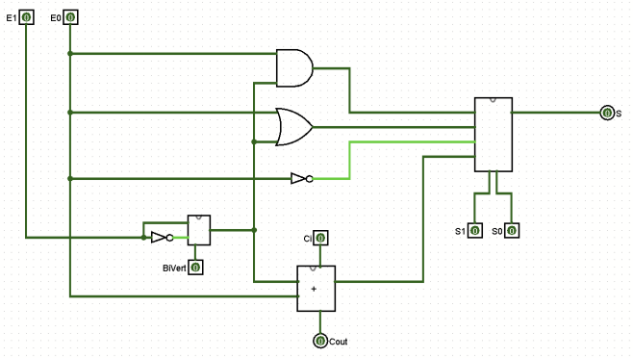
Mux 1 Seletor:



Mux 2 Seletores:



ULA 1 Bit:



ULA 4 Bits:

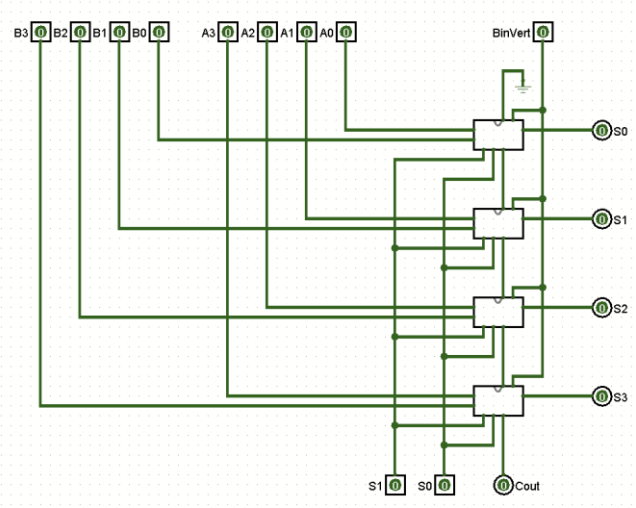


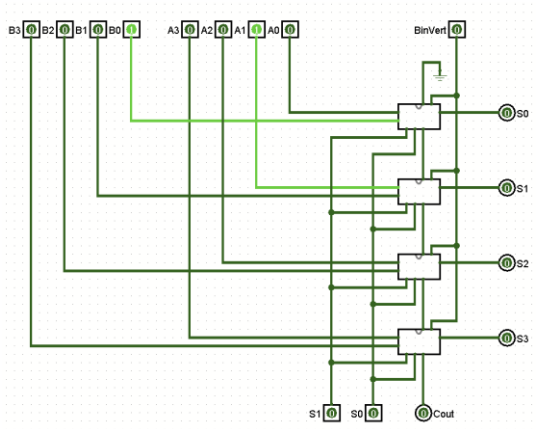
Tabela de resultados:

Instrução realizada	Binário (A,B,Op.code)	Valor em Hexa (0x ...)	Resultado em binário
AND(A,B)	0010 0001 00	0000 1000 0100 = 0x084	0000
OR(A,B)	0010 0011 01	0000 1000 1101 = 0x08D	0011
SOMA(A,B)	0010 0011 11	0000 1000 1111 = 0x08F	0101
NOT(A)	1100 0011 10	0011 0000 1110 = 0x30E	0011

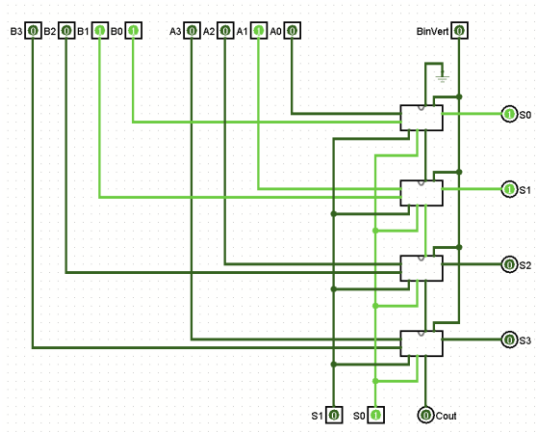
Print dos testes da ULA:

Inicio:

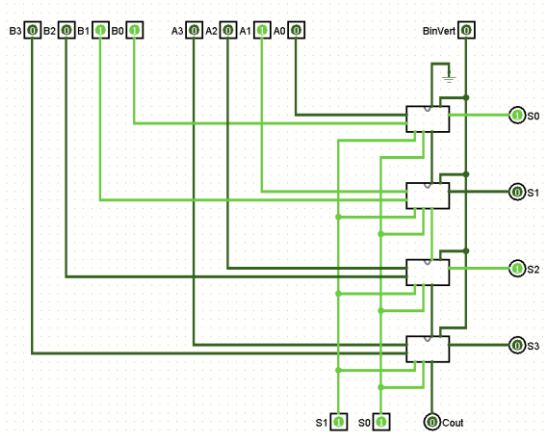
A=2; (ou A=0010)
B=1; (ou B=0001)
AND(A,B);



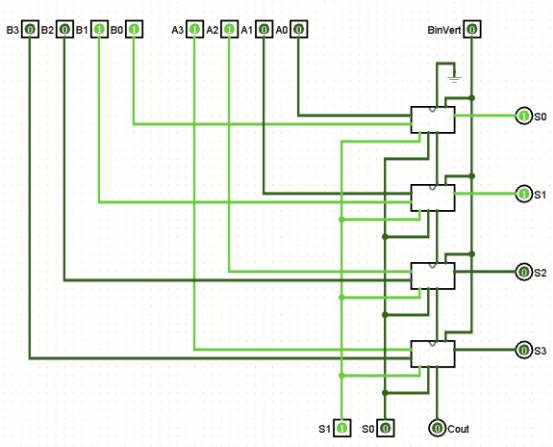
B=3; (ou B=0011)
OR(A,B);



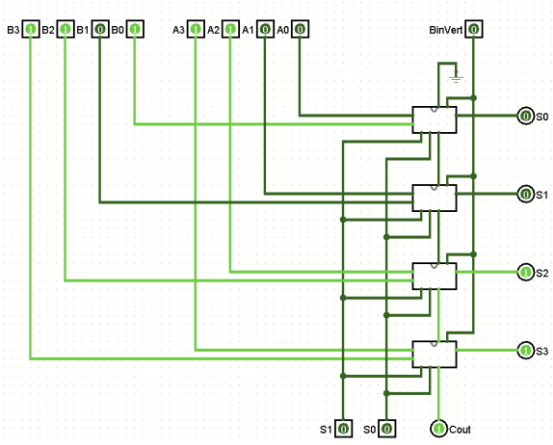
SOMA(A,B);



A=12; (ou A=1100)
NOT(A);



B=13; (ou B=1101)
AND(B,A);



Fim.

Parte 2

ULA 74LS181:

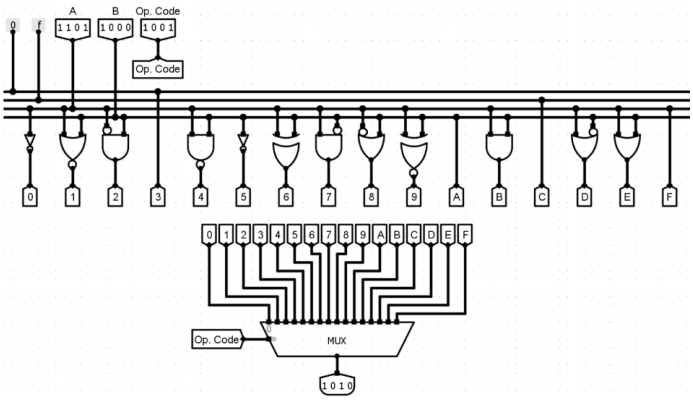


Tabela teste com as funções da ULA 74LS181:

Instruções	Binário	Resultado da operação
450	0100 0101 0000	0xB
CB1	1100 1011 0001	0x2
A32	1010 0011 0010	0x1
C43	1100 0100 0011	0x0
124	0001 0010 0100	0xF
785	0111 1000 0101	0x7
9B6	1001 1011 0100	0x2
CD7	1100 1101 0111	0x0
FE8	1111 1110 1000	0xE
649	0110 0100 1001	0xD
D9A	1101 1001 1010	0x9
FCB	1111 1100 1011	0xC
23F	0010 0011 1111	0x2
63C	0110 0011 1100	0xF
98D	1001 1000 1101	0xF
76E	0111 0110 1110	0x7

3) Se o objetivo fosse realmente testar a ULA, seria necessário 4096 linhas pois são 4 Bits de entrada A + 4 Bits de entra B + 4 Bits de seleção, assim 2^4 + 2^4 + 2^4 = 2^12 = 4096