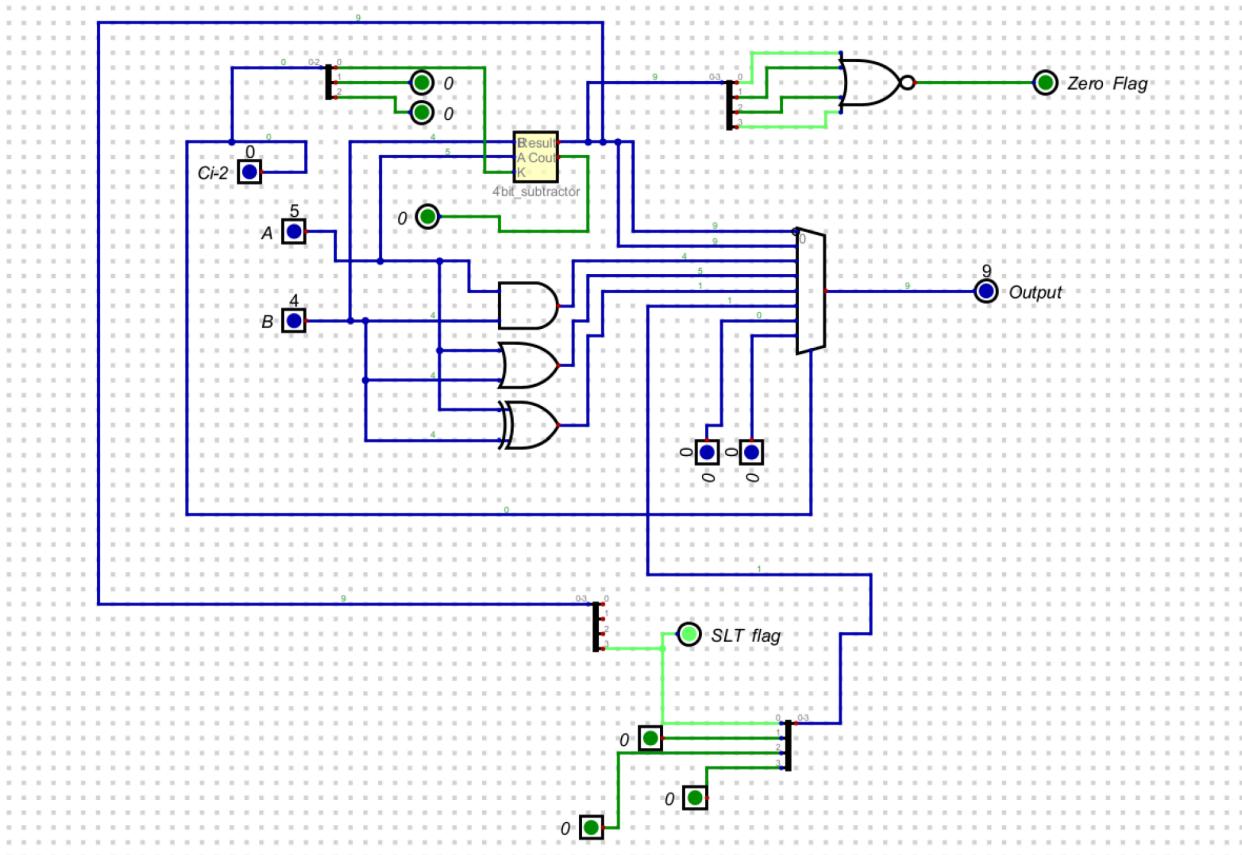


Test Cases

ALU Main Test Cases:

1. Addition: Control Signal = 0, A = 5, B = 4, Output = 9, Carry out = 0

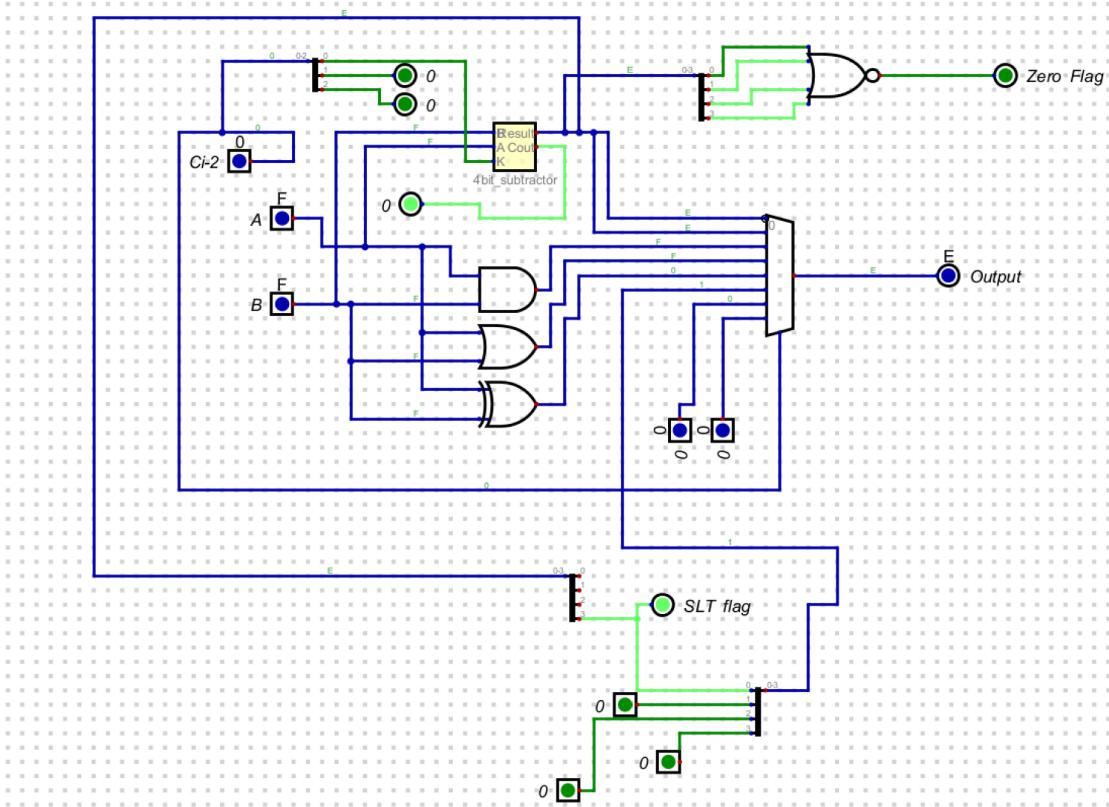


Control Signal = 0, A = 15, B = 15, Output = E, Carry out = 1

$$1111 + 1111 = 11110$$

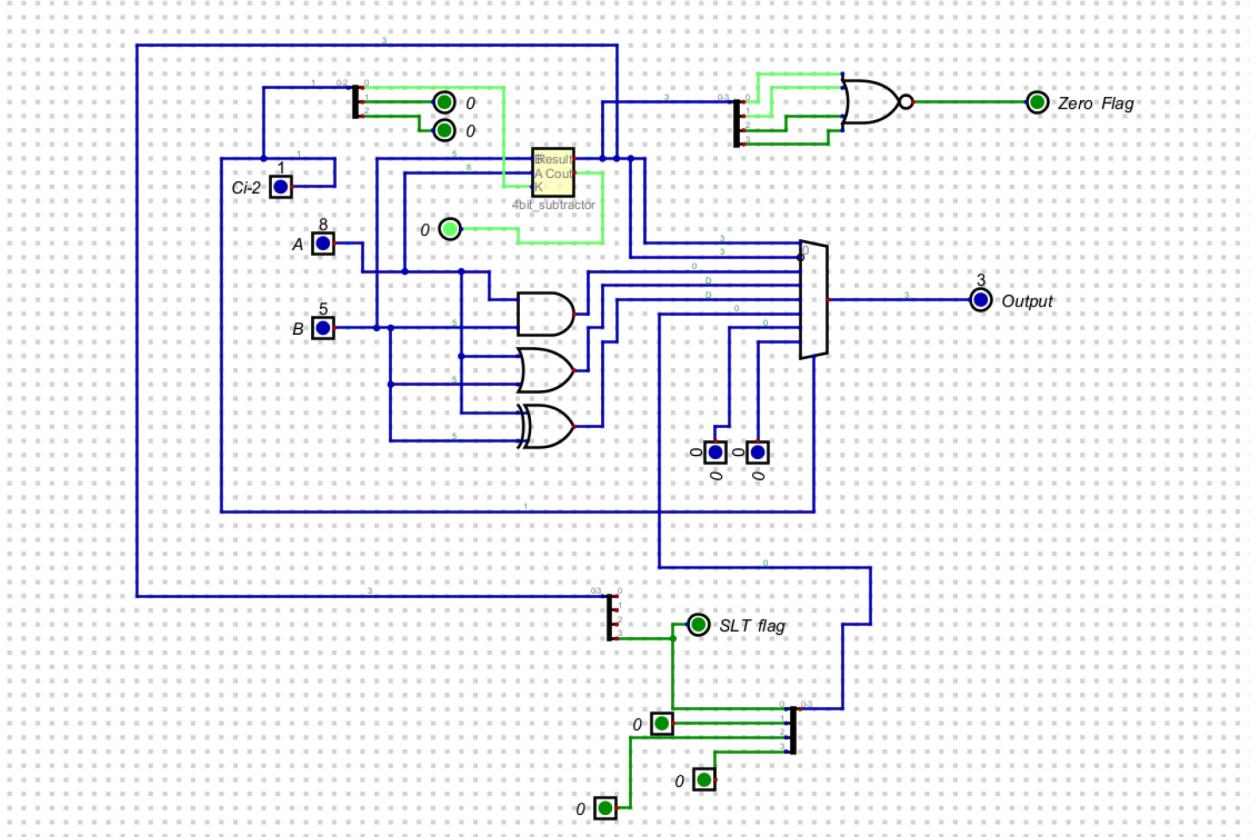
Takes the last 4 bits which is 1110 = E

Carry out = MSB = 1

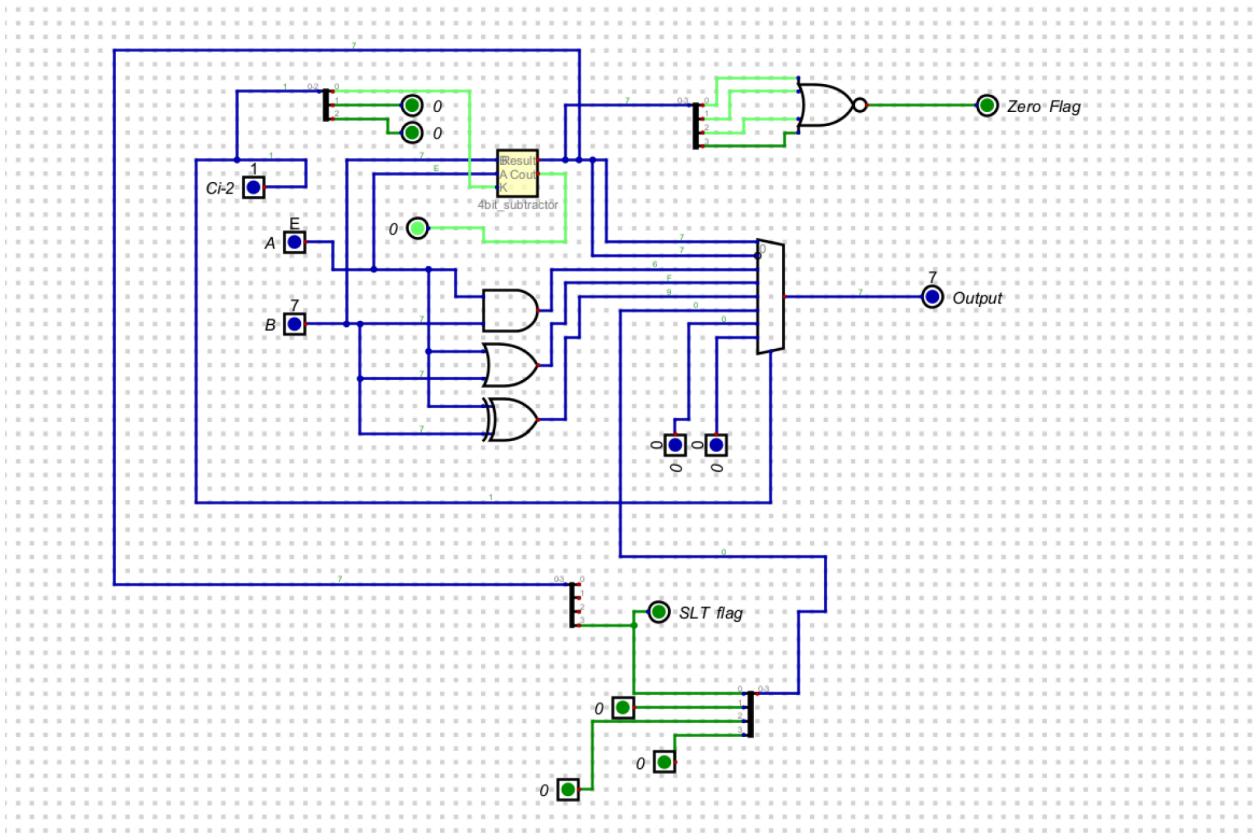


2. Subtraction: Control Signal = 1, A = 8, B = 5, Output = 3, Carry out = 1

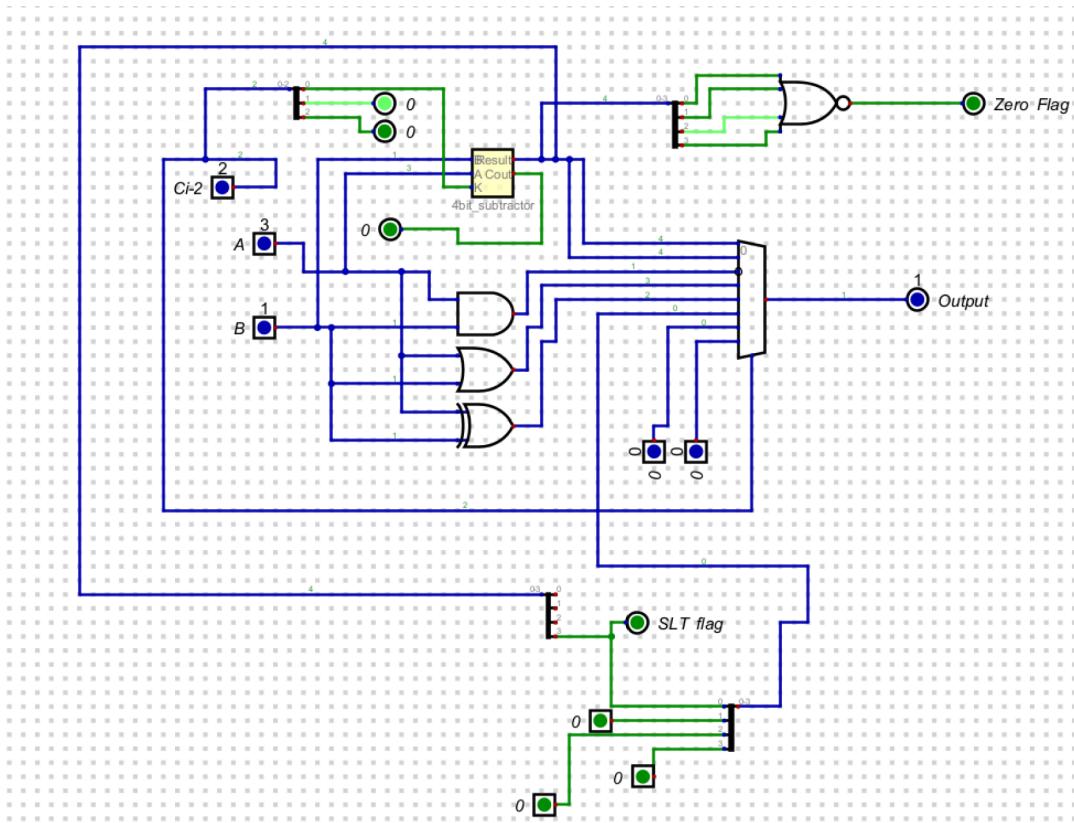
$$1000 - 0101 = 10011$$



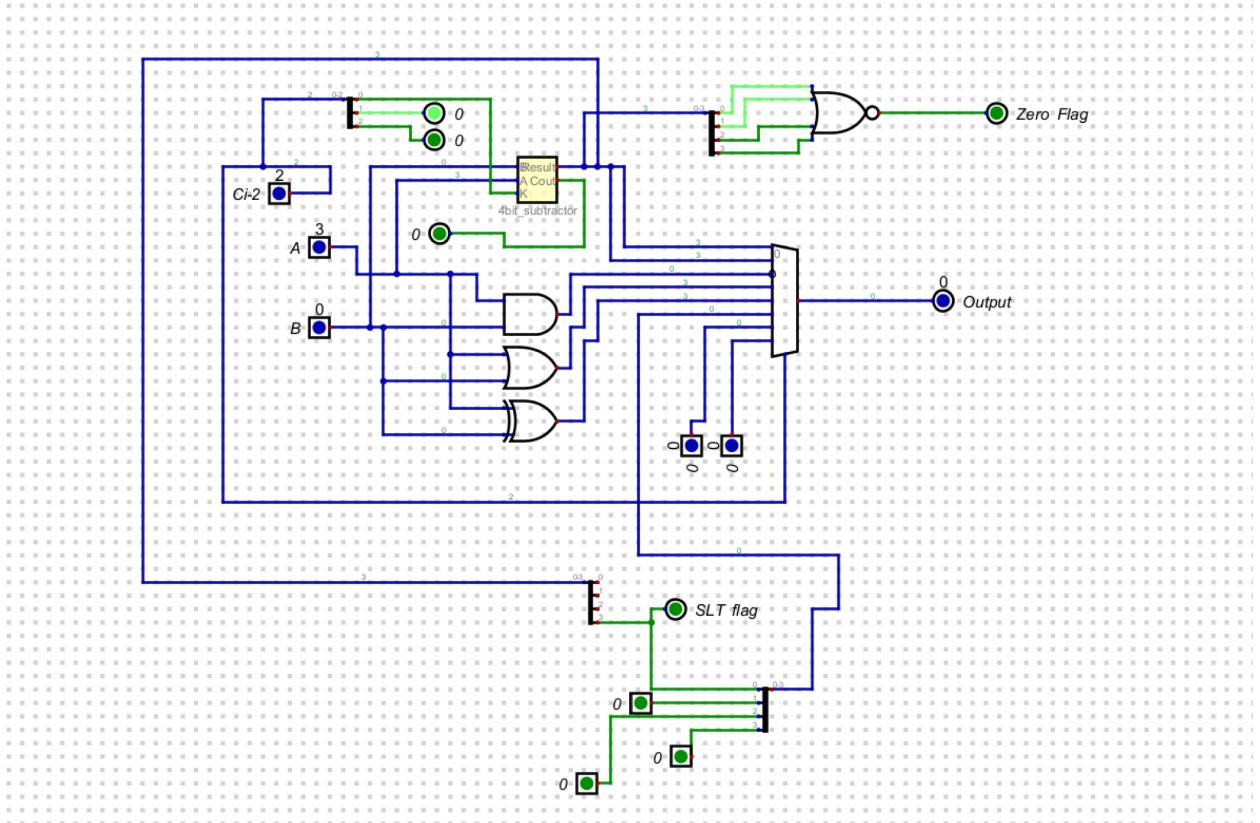
Control Signal = 1, A = 14, B = 7, Output = 7, Carry out = 1



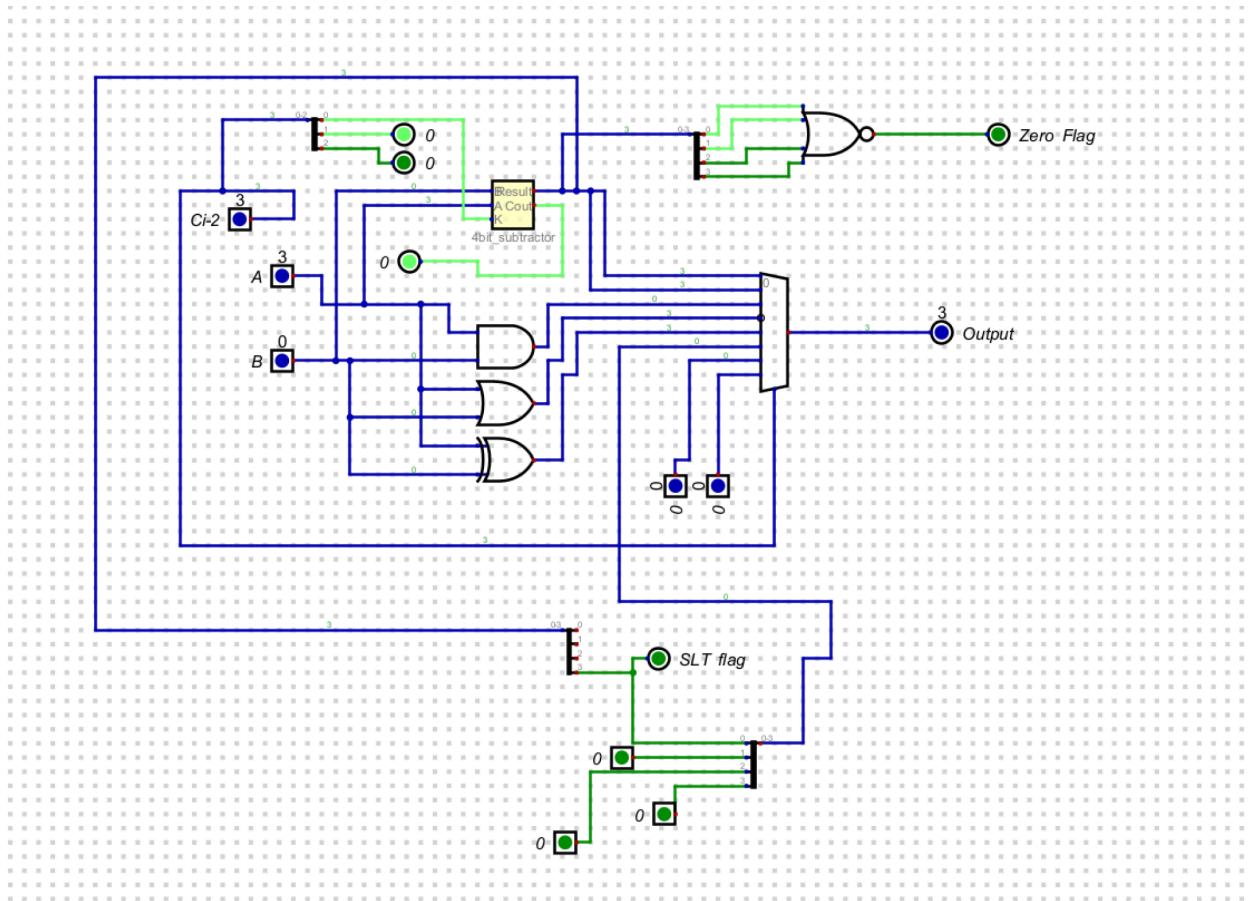
3. AND: Control Signal = 2, A = 3, B = 1, Output = 1, Carry out = 0



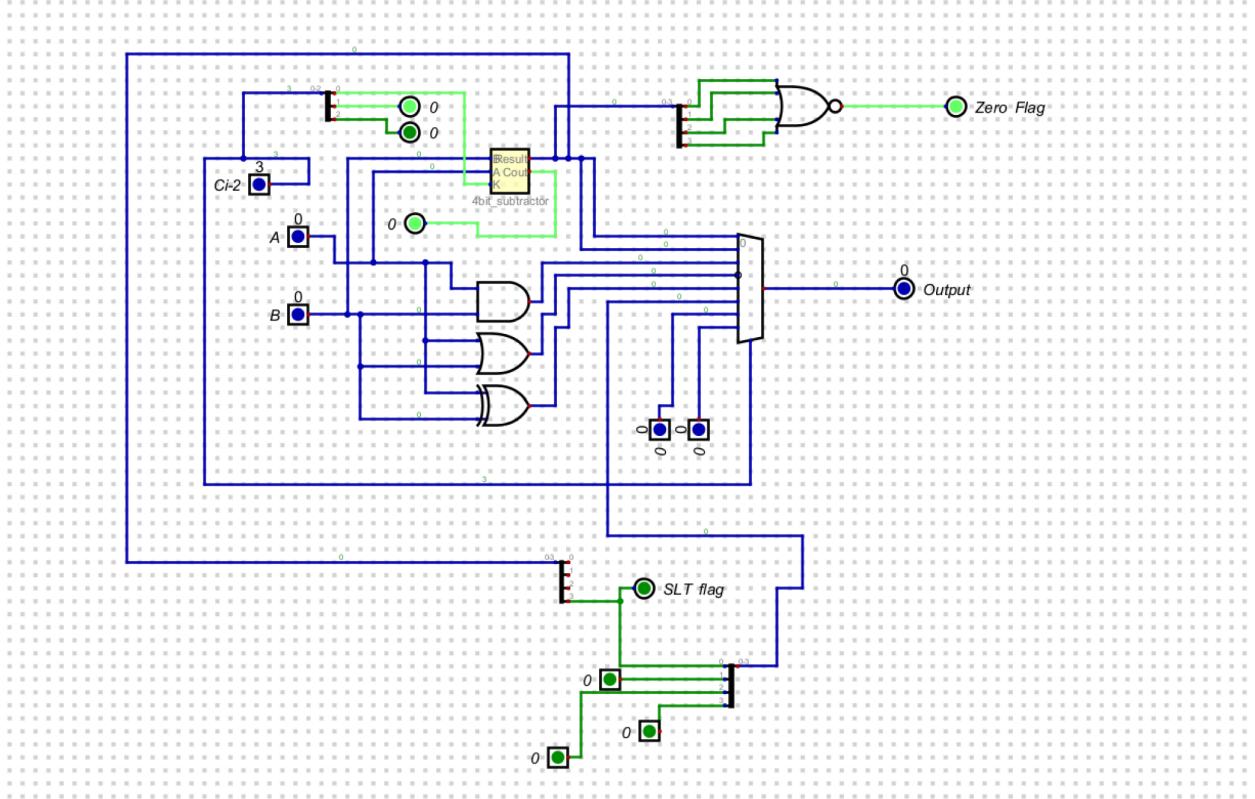
Control Signal = 2, A = 3, B = 0, Output = 0, Carry out = 0



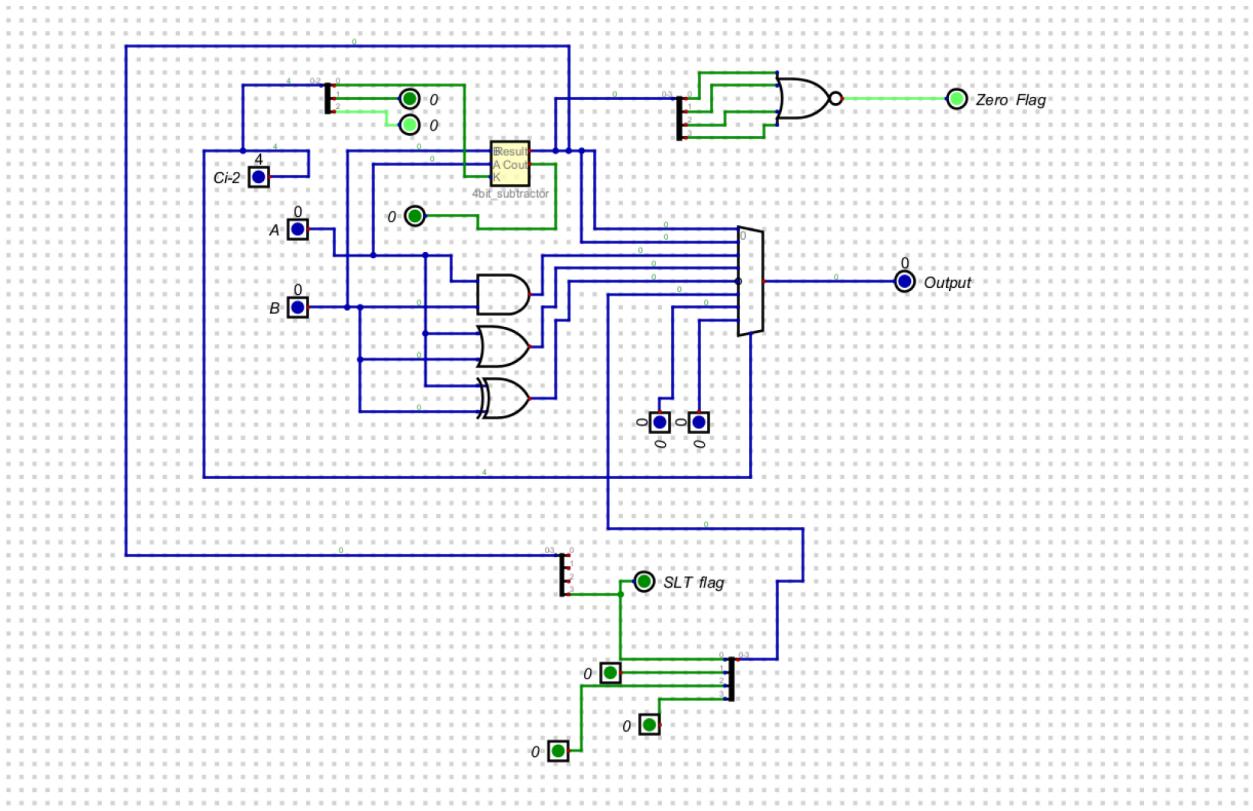
4. OR: Control Signal = 3, A = 3, B = 0, Output = 3, Carry out = 1



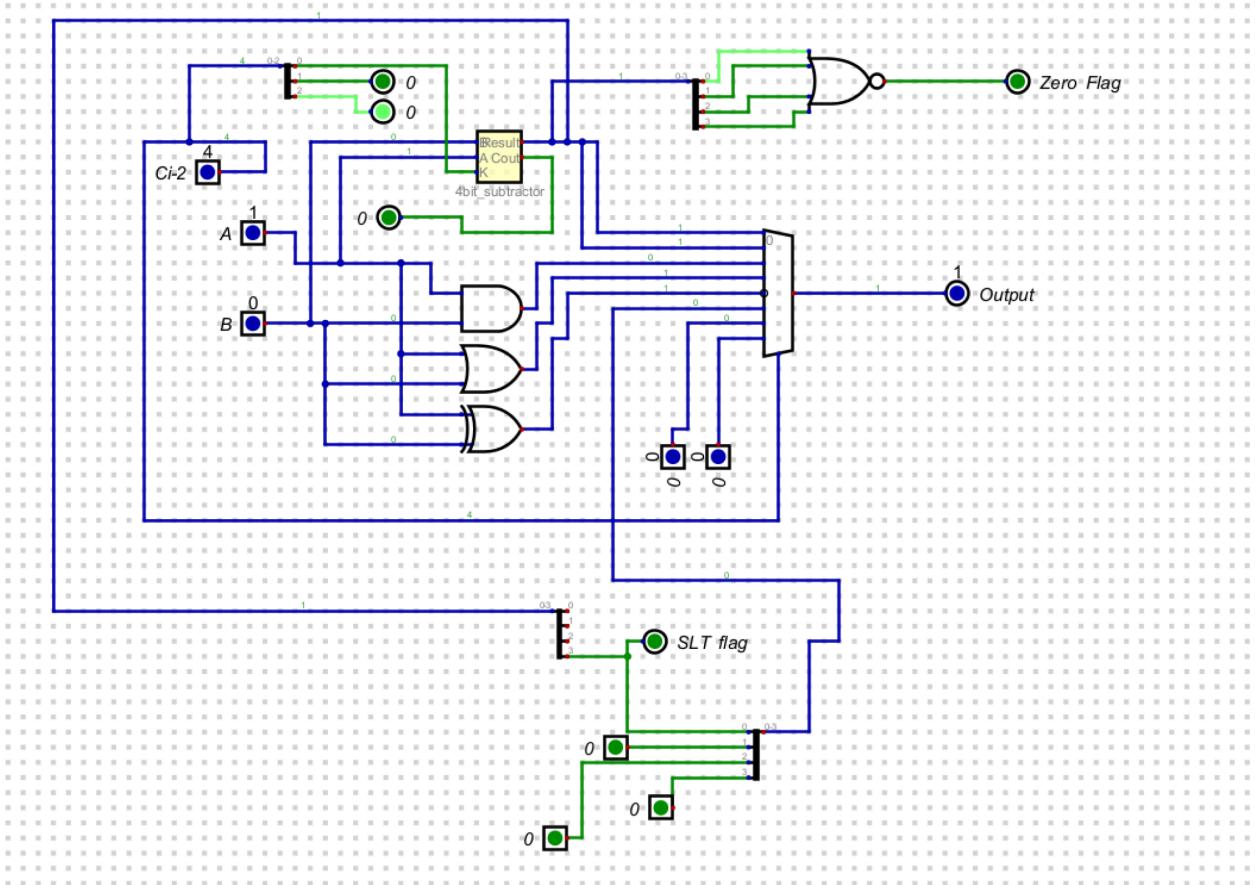
Control Signal = 3, A = 0, B = 0, Output = 0, Carry out = 1



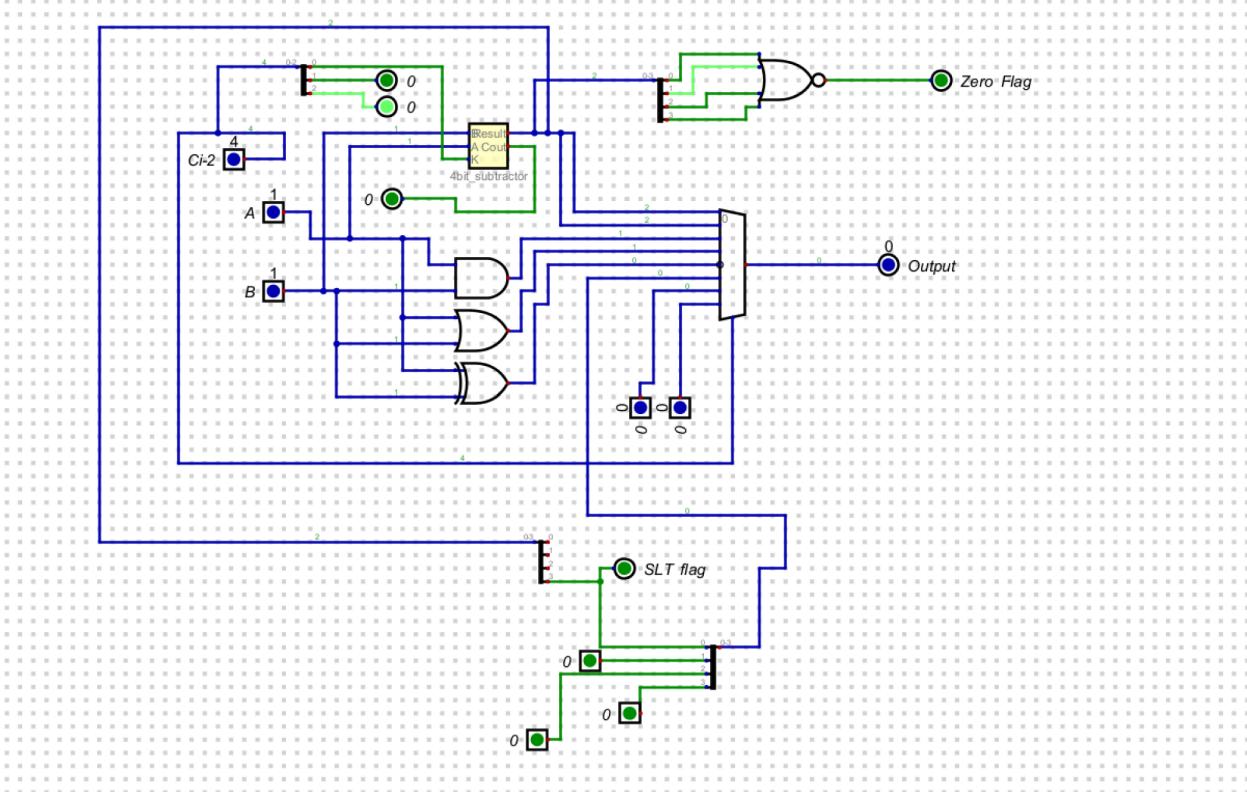
5. XOR: Control Signal = 4, A = 0, B = 0, Output = 0, Carry out = 0



Control Signal = 4, A = 1, B = 0, Output = 1, Carry out = 0

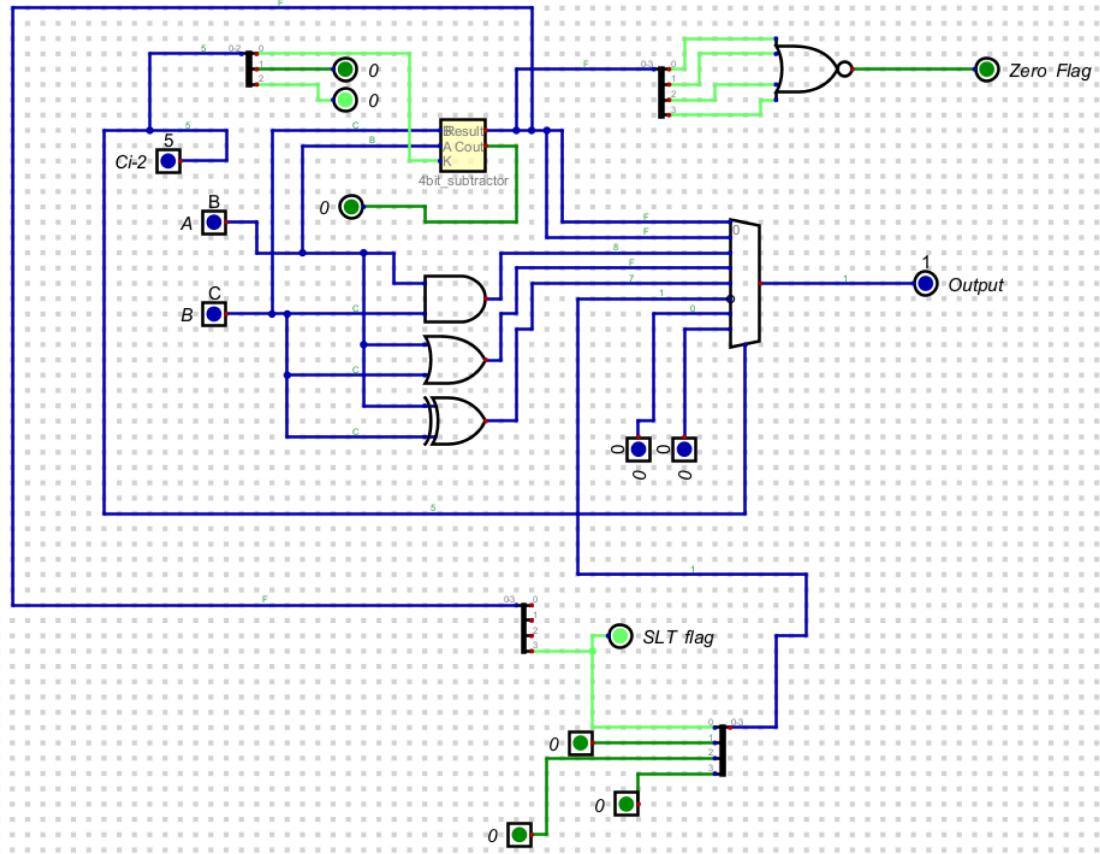


Control Signal = 4, A = 1, B = 1, Output = 0, Carry out = 0

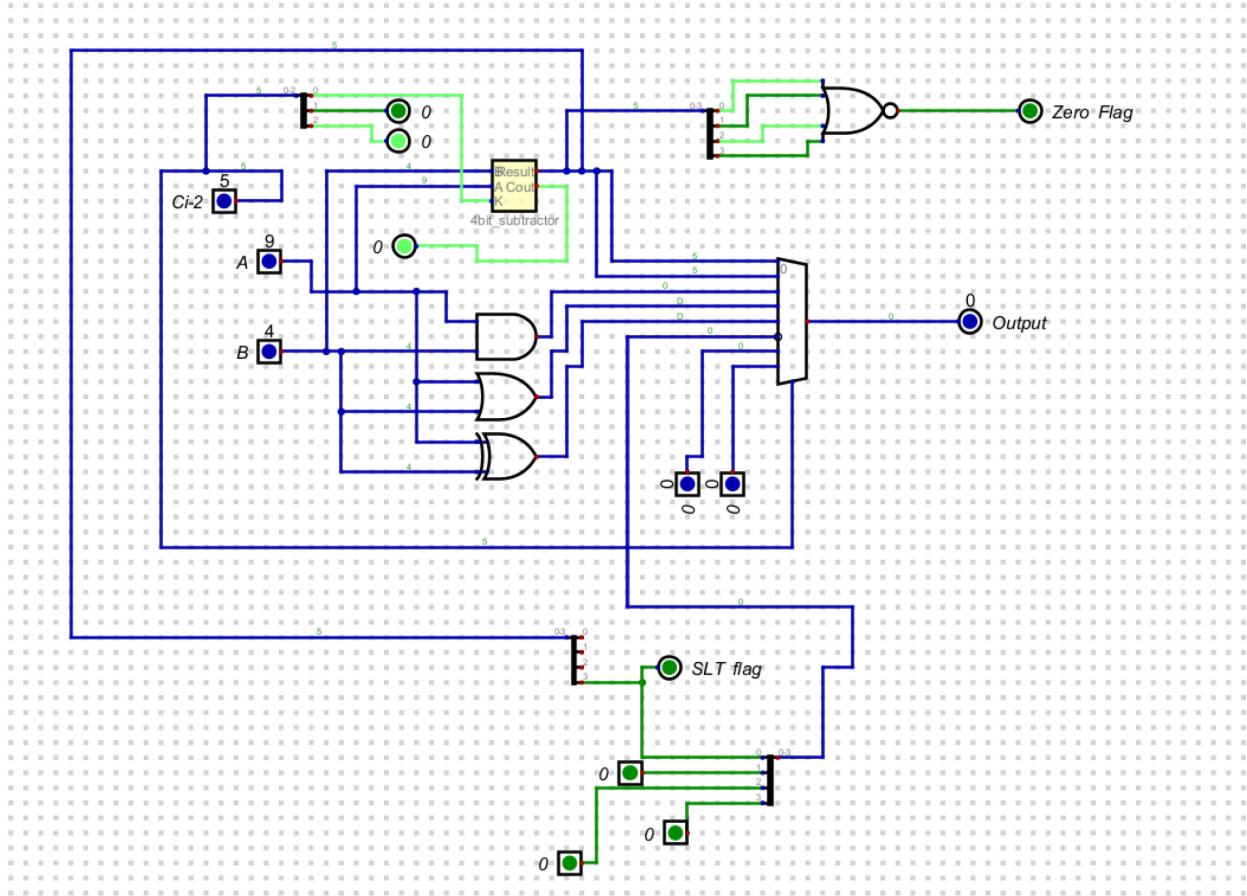


6. SLT: Control Signal = 5, A = 12, B = 13, Output = 1, Carry out = 0, SLT

Flag = 1

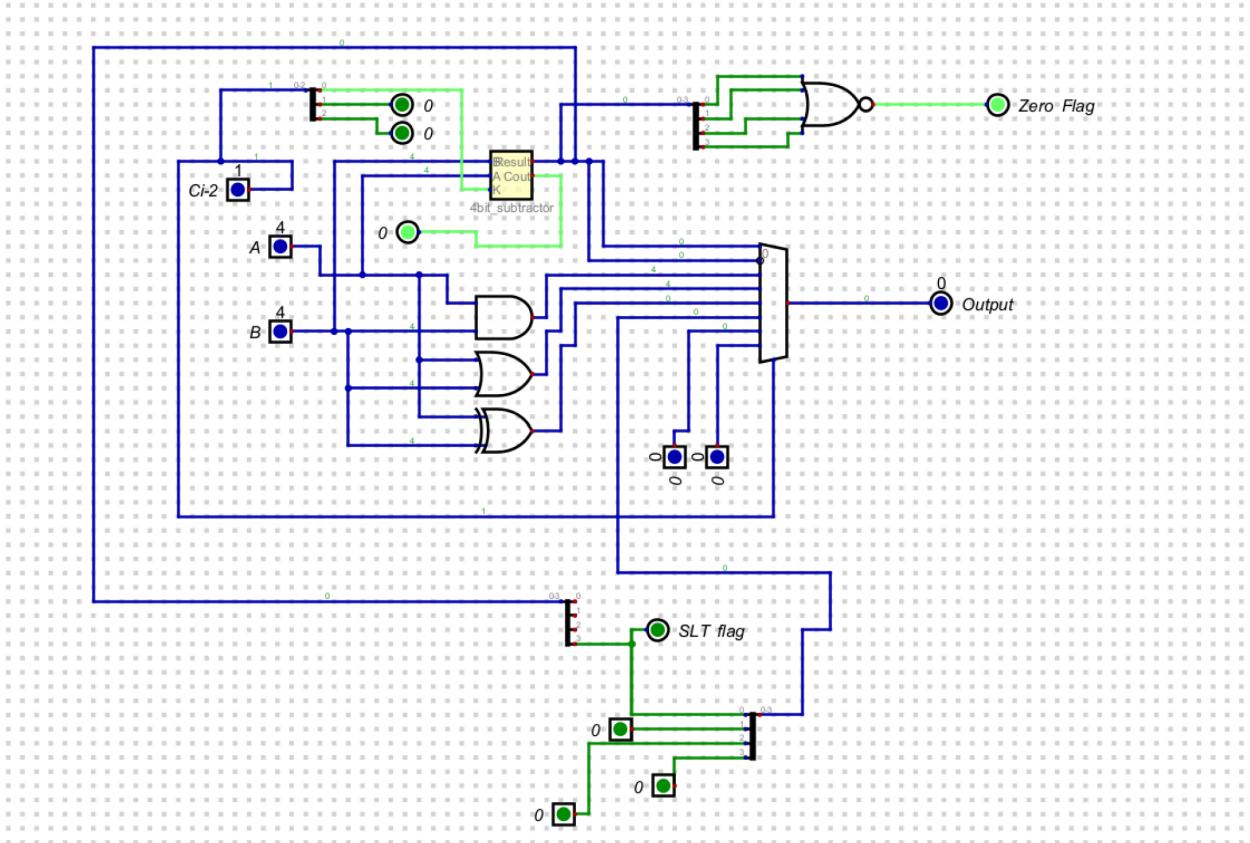


Control Signal = 5, A = 9, B = 4, Output = 0, Carry out = 1, SLT Flag = 0



7. Zero Flag: Control Signal = 1, A = 4, B = 4, Output = 0, Carry out = 1,

Zero Flag = 1



Control Signal = 1, A = 5, B = 4, Output = 1, Carry out = 1, Zero Flag = 0

