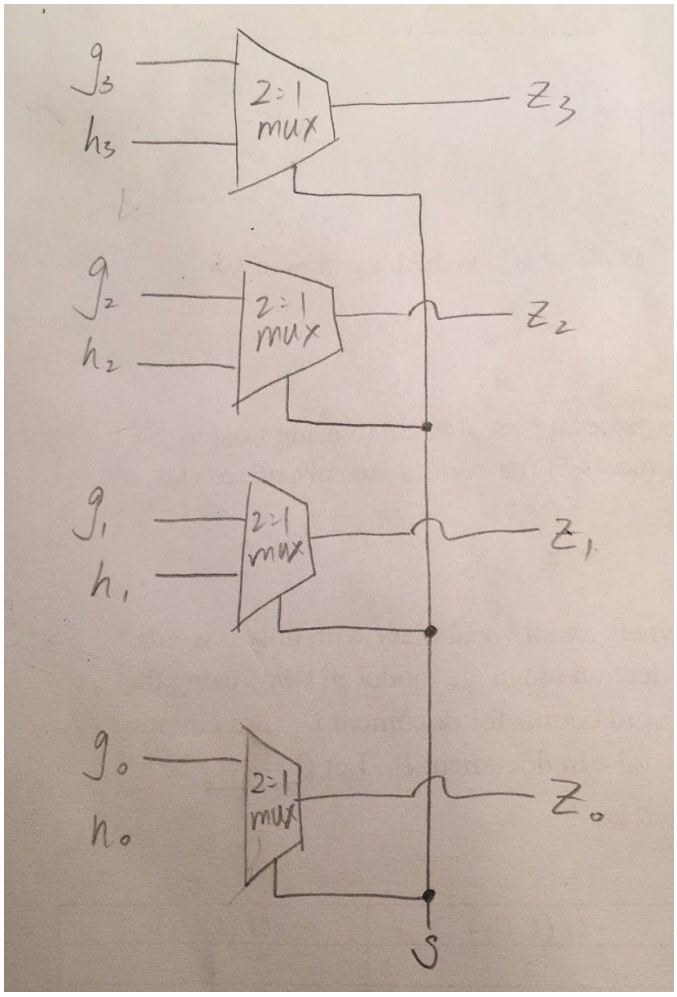
1.

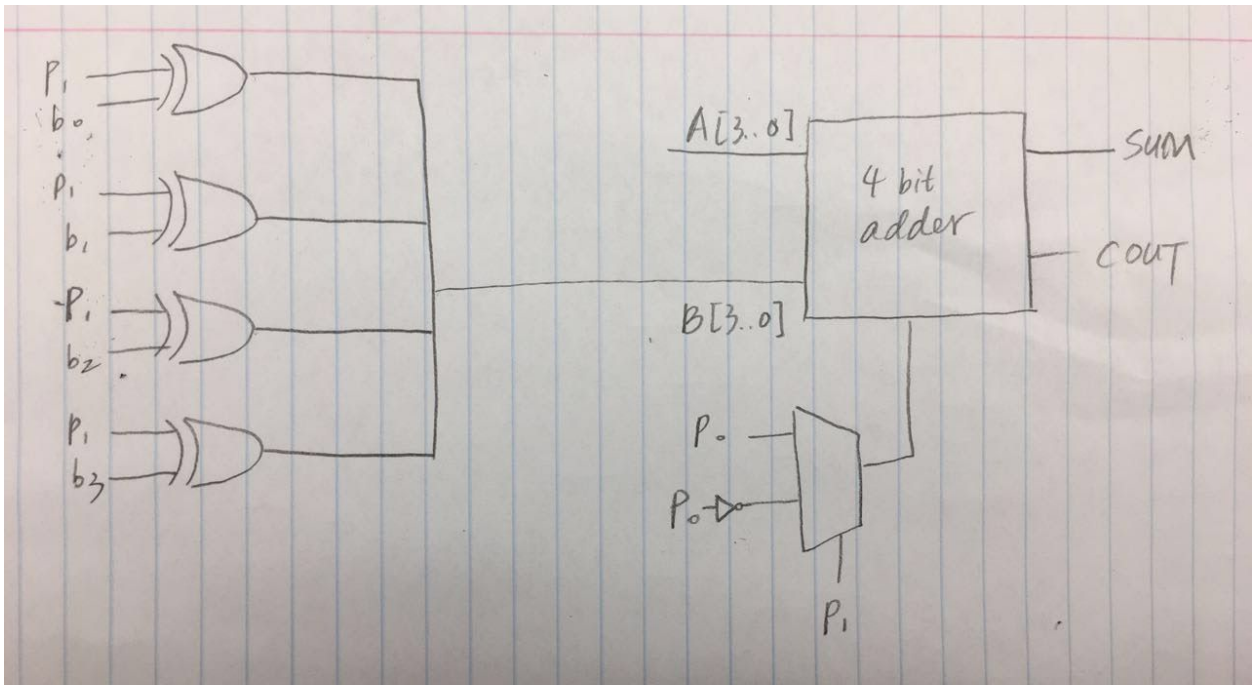



2.

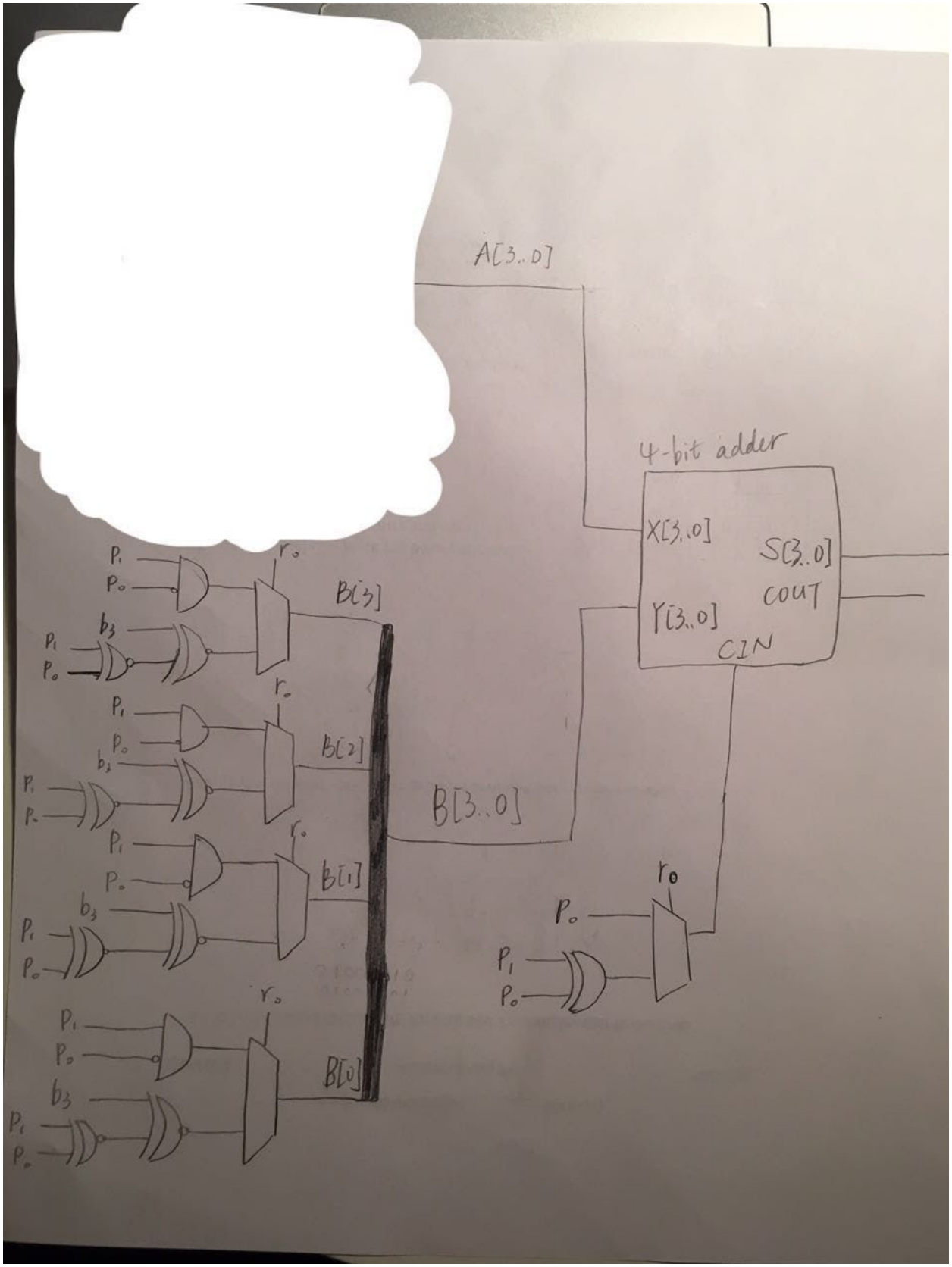
| **Op-select input** | **Adder 4-bit A inputs** | **Adder 4-bit B inputs** | **Adder Carry-in** | **Operation** | **Notes** |
|---|---|---|---|---|---|
| **r1 r0 p1 p0** | **a3 a2 a1 a0** | **b3 b2 b1 b0** | | | |
| 0 0 0 0 | a3 a2 a1 a0 | b3 b2 b1 b0 | 0 | X = A + B | Add |
| 0 0 0 1 | a3 a2 a1 a0 | b3 b2 b1 b0 | 1 | X = A + B + 1 | Add and increment |
| 0 0 1 0 | a3 a2 a1 a0 | b3’ b2’ b1’ b0’ | 0 | X = A - B - 1 | Subtract and decrement |
| 0 0 1 1 | a3 a2 a1 a0 | b3’ b2’ b1’ b0’ | 1 | X = A - B | subtract |
| 0 1 0 0 | a3 a2 a1 a0 | 0 0 0 0 | 0 | X = A | Transfer A |
| 0 1 0 1 | a3 a2 a1 a0 | 0 0 0 0 | 1 | X = A + 1 | Increment A |

| | | | | | |
|---|---|---|---|---|---|
| 0 1 1 0 | a3 a2 a1 a0 | 1 1 1 1 | 0 | X = A - 1 | Decrement A |
| 0 1 1 1 | a3 a2 a1 a0 | 0 0 0 0 | 0 | X = A | Transfer A |

3.




4.




5.

1. Let r1 = r0 = p1 = p0 = 0, see if the result is A + B.
2. Let r1 = r0 = p1 = 0, p0 = 1, see if there is an increment compared to the first result, which is A + B.
3. Let r1 = r0 = 0, p1 = p0 = 1, see if the result is A - B.
4. Let r1 = r0 = p0 = 0, p1 = 1, see if there is an decrement compared to the third result, which is A - B.
5. Let r1 = p1 = p0 = 0, r0 = 1, see if A goes through.
6. Let r1 = 0, r0 = p1 = p0 = 0, see if A goes through.
7. Let r1 = p1 = 0, r0 = p0 = 1, see if there is an increment compared to the sixth result, which is A.
8. Let r1 = p0 = 0, r0 = p1 = 1, see if there is an decrement compared to the sixth result, which is A.