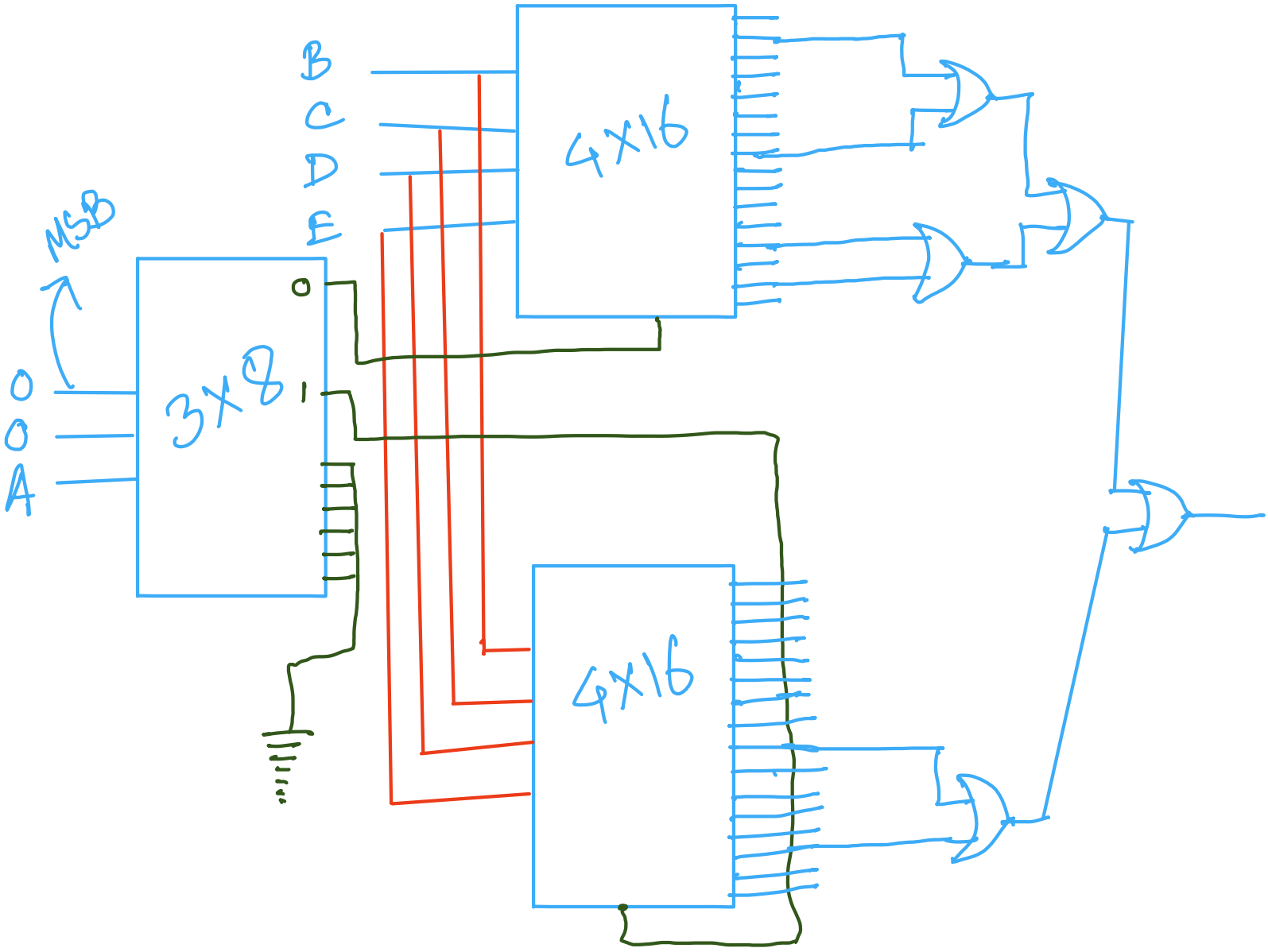
**For All questions, multiple solutions are available. I showed only one possible way.**

| | |
|---|---|
| 1.CO3 | **Build** the following function using both 4x16 decoder(s) and 3x8 decoder(s) in a single circuit:<br>F(A,B,C,D,E)=Σ (1, 7, 12, 14, 24, 30)<br>In your circuit, the number of 4x16 decoder(s) must be more than the number of 3x8 decoder(s). |
| 2.CO3 | **Implement** the boolean function using both 4:1 MUX(s) and 2:1 MUX(s) in a single circuit.<br>F(A,B,C,D) = ∑ (2,1,4,5,9,14,15)<br>In your circuit, the number of 4:1 mux(s) must be more than the number of 2:1 mux(s). |

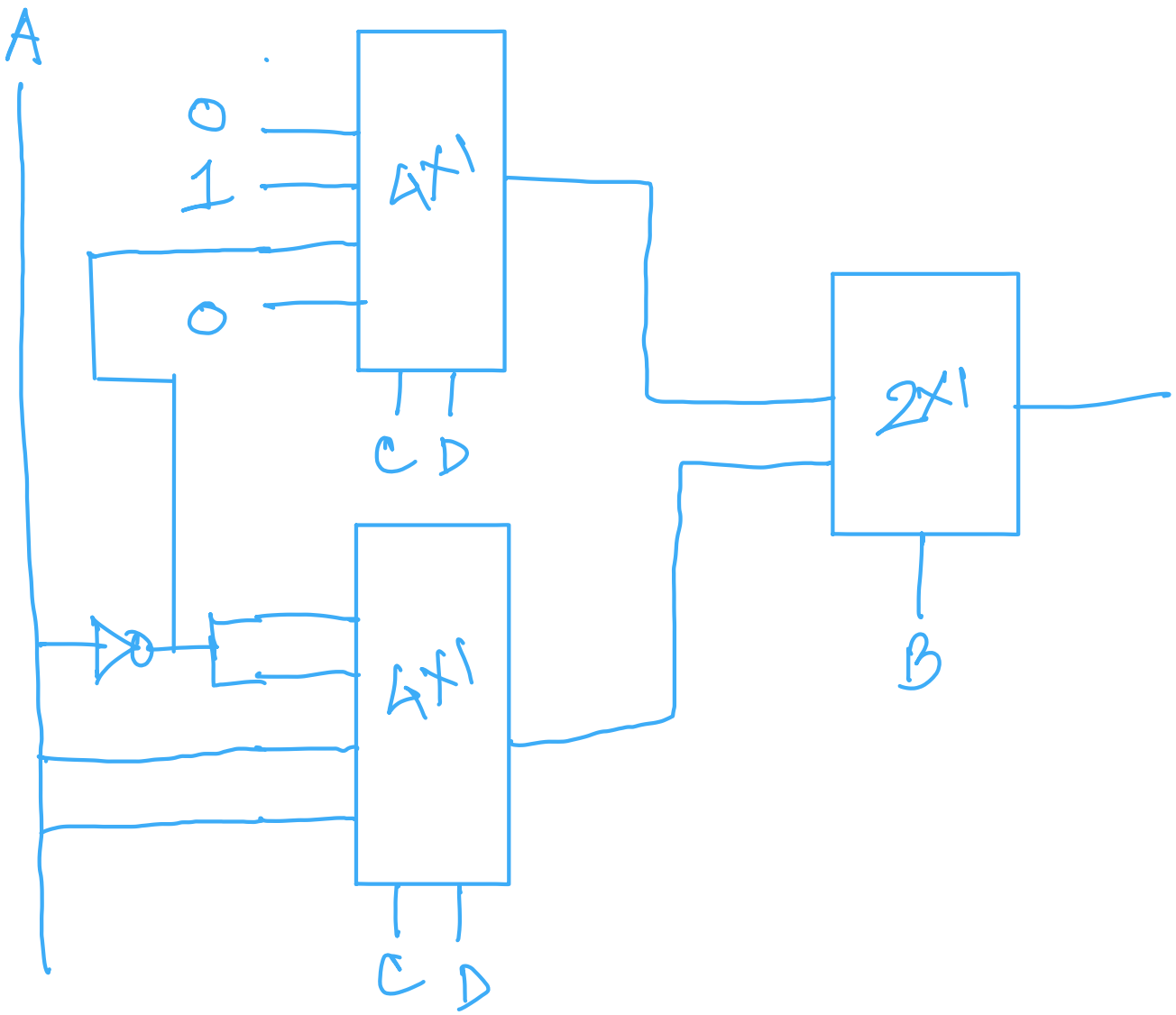
Solution

1



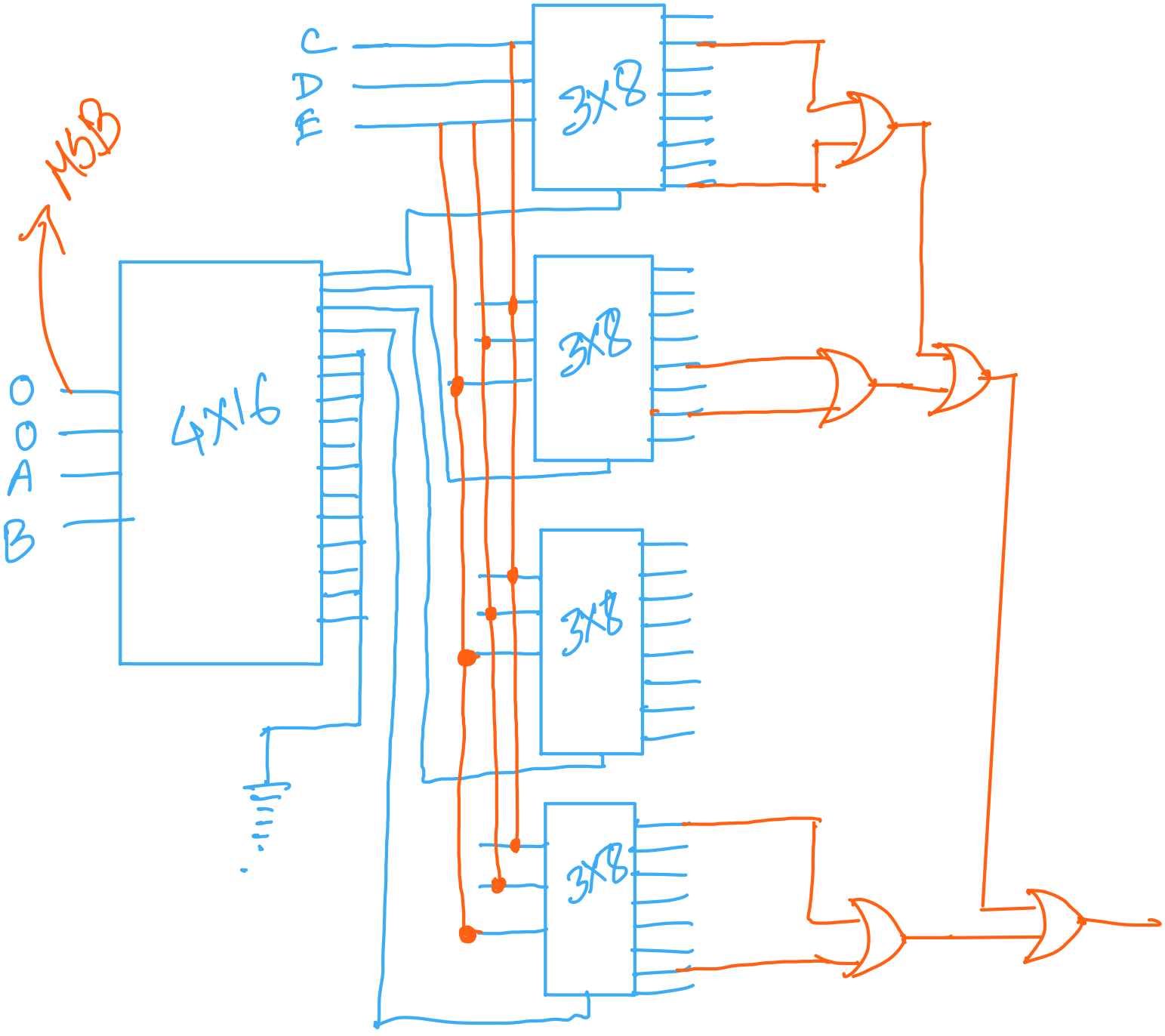
# 2

| | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ | $I_6$ | $I_7$ |
|---|---|---|---|---|---|---|---|---|
| A' | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| A | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 0 | 1 | A' | 0 | A' | A' | A | A |



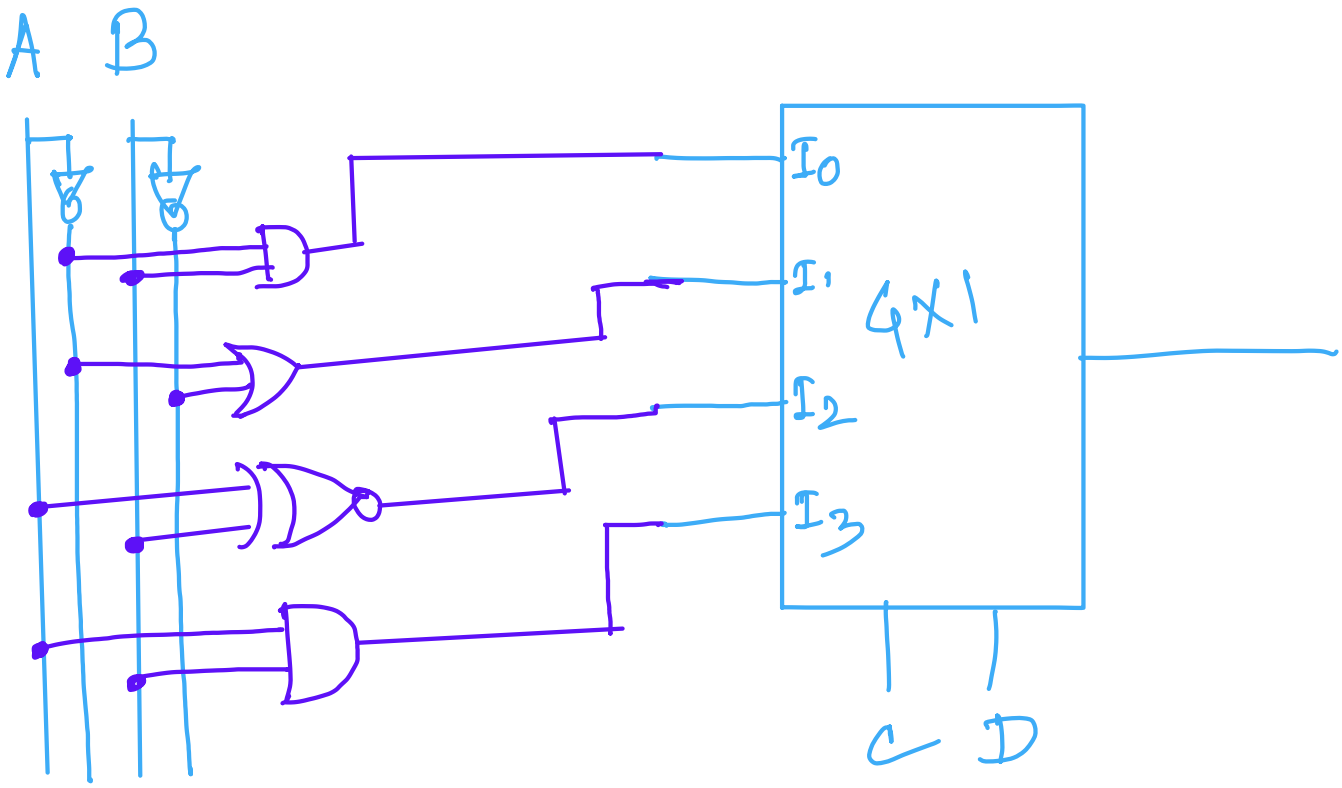
| | |
|---|---|
| 1.CO3 | **Build** the following function using both 4x16 decoder(s) and 3x8 decoder(s) in a single circuit:<br>F(A,B,C,D,E)=Σ (1, 7, 12, 14, 24, 30)<br>In your circuit, the number of 4x16 decoder(s) must be less than the number of 3x8 decoder(s). |
| 2.CO3 | **Implement** the boolean function using only one 4:1 MUX.<br>F(A,B,C,D) = ∑ (2,1,4,5,9,14,15) |

1

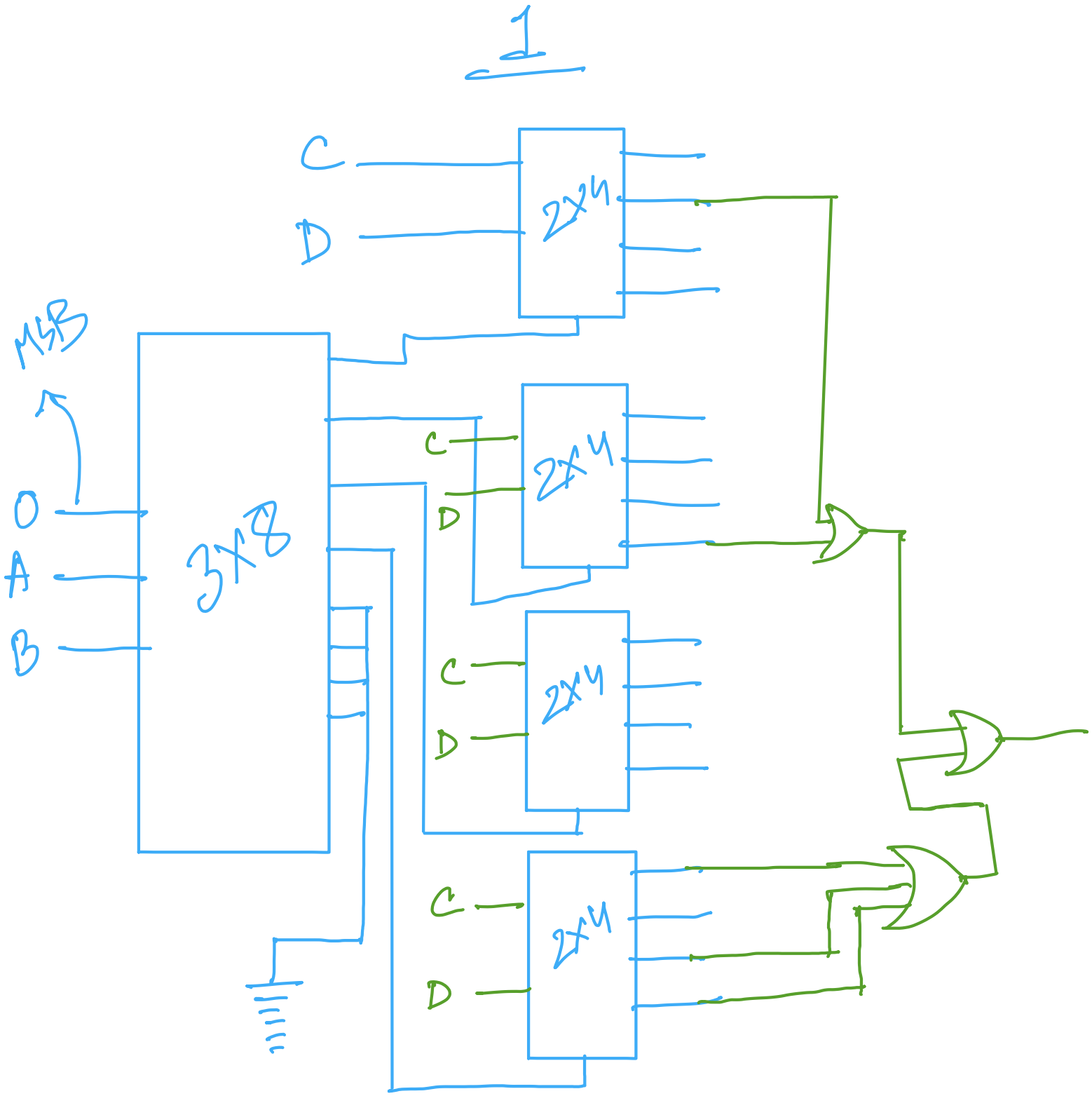


2

| | $I_0$ | $I_1$ | $I_2$ | $I_3$ |
|---|---|---|---|---|
| $A'B'$ | 0 | 1 | 2 | 3 |
| $A'B$ | 4 | 5 | 6 | 7 |
| $AB'$ | 8 | 9 | 10 | 11 |
| $AB$ | 12 | 13 | 14 | 15 |
| | $A'B$ | $A'+B'$ | $A \odot B$ | $AB$ |

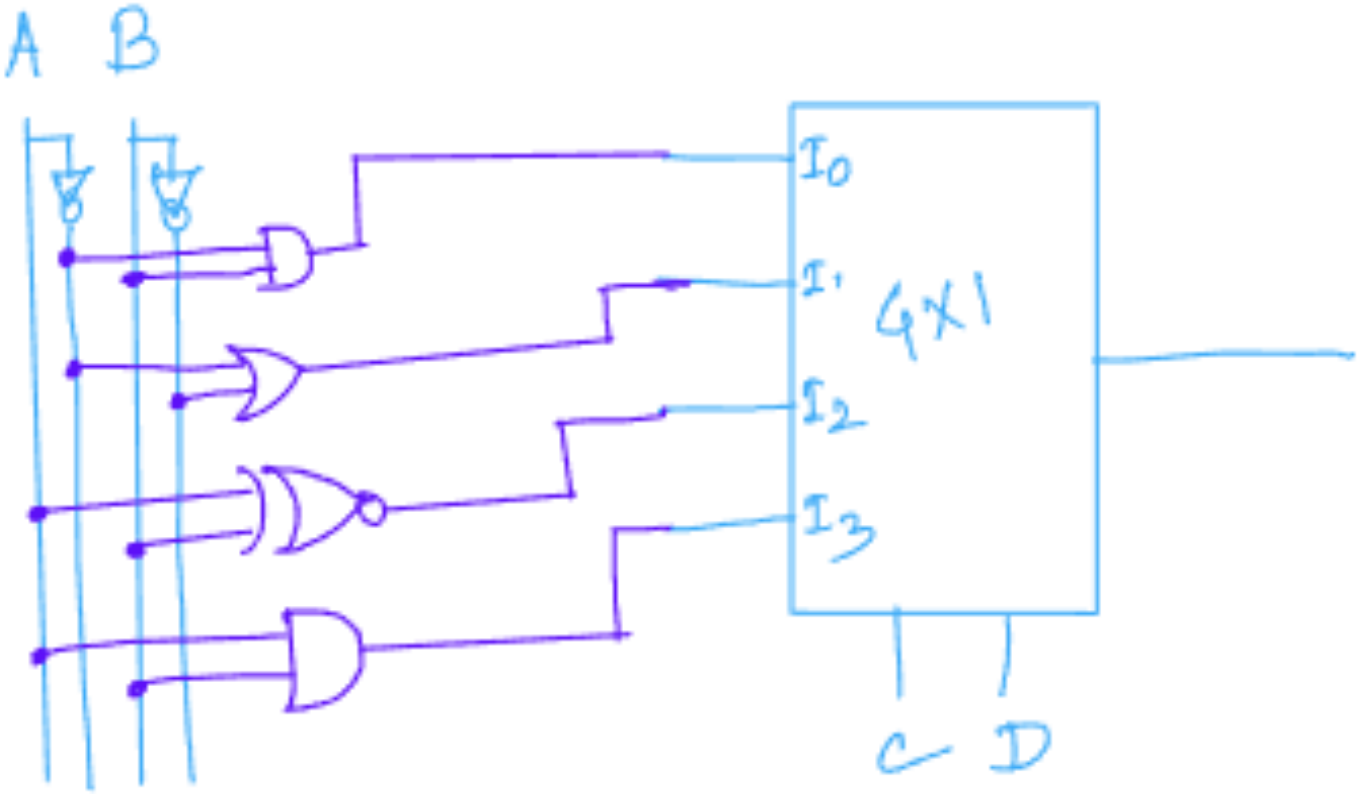


| | |
|---|---|
| 1.CO3 | **Build** the following function using both 3x8 decoder(s) and 2x4 decoder(s) in a single circuit:<br>F(A,B,C,D)=Σ (1, 7, 12, 14, 15)<br>In your circuit, the number of 3x8 decoder(s) must be less than the number of 2x4 decoder(s). |
| 2.CO3 | **Implement** the boolean function using only one 4:1 MUX.<br>F(A,B,C,D) = ∑ (2,1,4,5,9,14,15) |



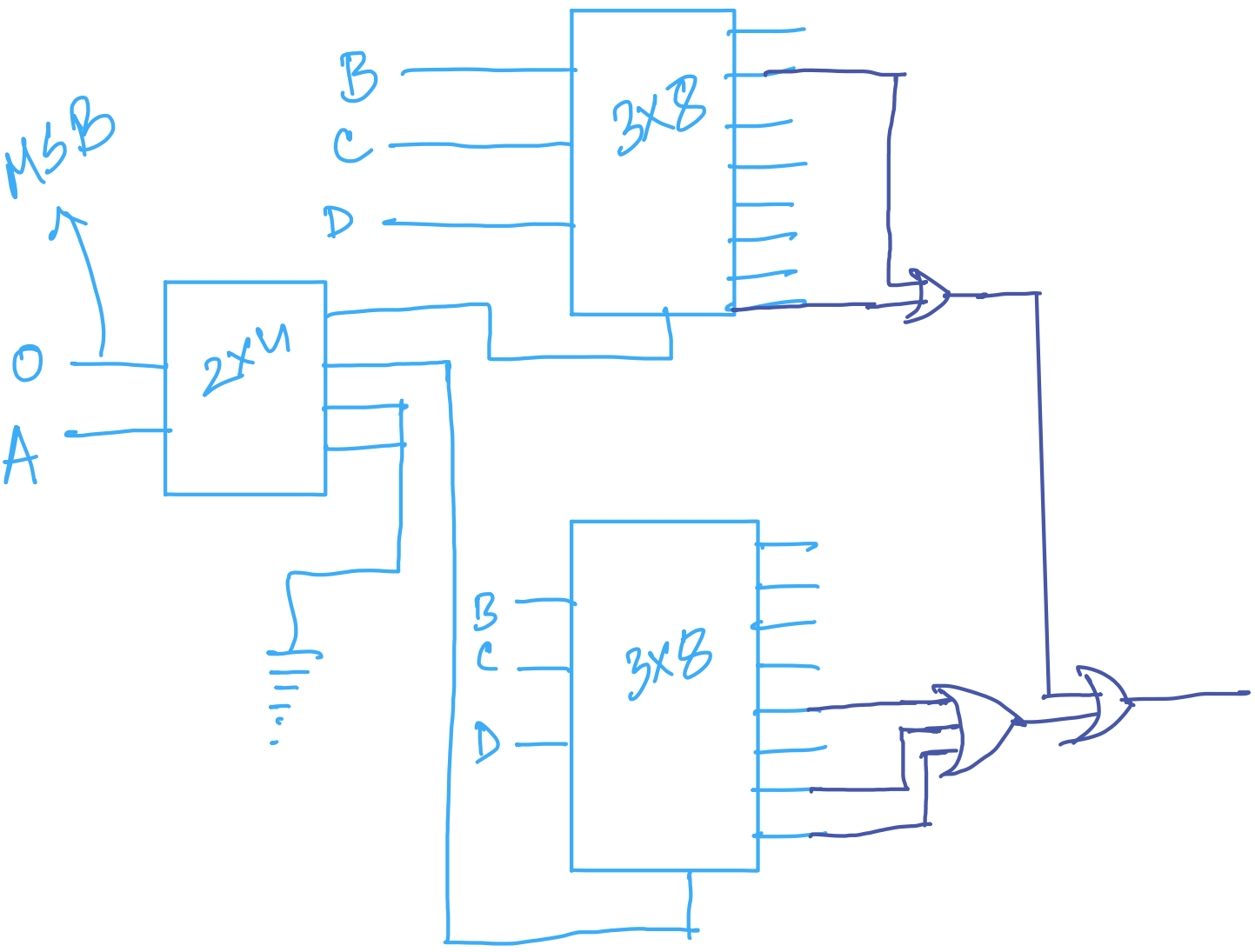
2

| | $I_0$ | $I_1$ | $I_2$ | $I_3$ |
|---|---|---|---|---|
| $A'B'$ | 0 | 1 | 2 | 3 |
| $A'B$ | 4 | 5 | 6 | 7 |
| $AB'$ | 8 | 9 | 10 | 11 |
| $AB$ | 12 | 13 | 14 | 15 |
| | $A'B$ | $A'+B'$ | $A \odot B$ | $AB$ |



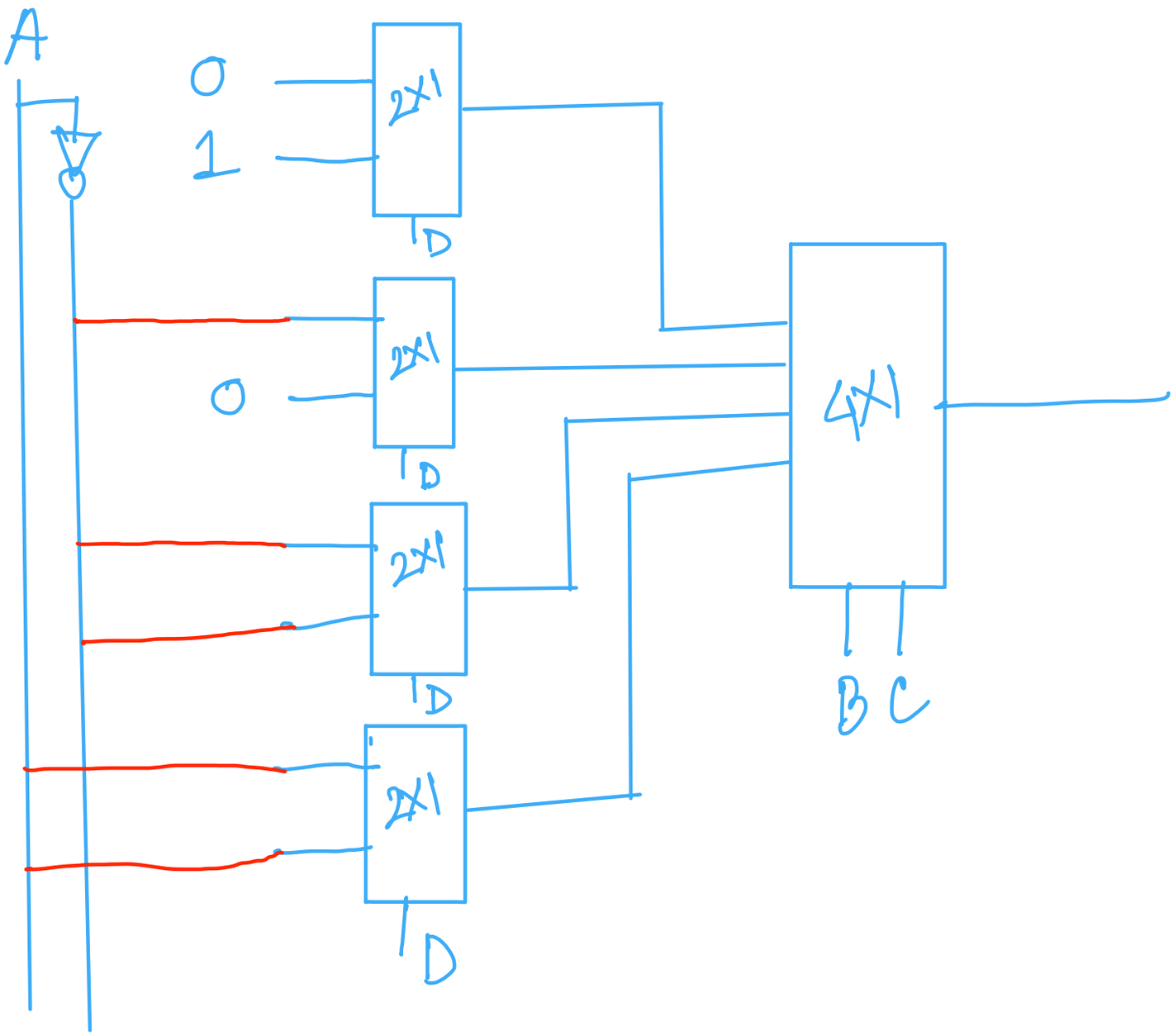
| | |
|---|---|
| 1.CO3 | **Build** the following function using both 3x8 decoder(s) and 2x4 decoder(s) in a single circuit:<br>F(A,B,C,D)=Σ (1, 7, 12, 14, 15)<br>In your circuit, the number of 3x8 decoder(s) must be more than the number of 2x4 decoder(s). |
| 2.CO3 | **Implement** the boolean function using both 4:1 MUX(s) and 2:1 MUX(s) in a single circuit.<br>F(A,B,C,D) = ∑ (2,1,4,5,9,14,15)<br>In your circuit, the number of 4:1 mux(s) must be less than the number of 2:1 mux(s). |

1



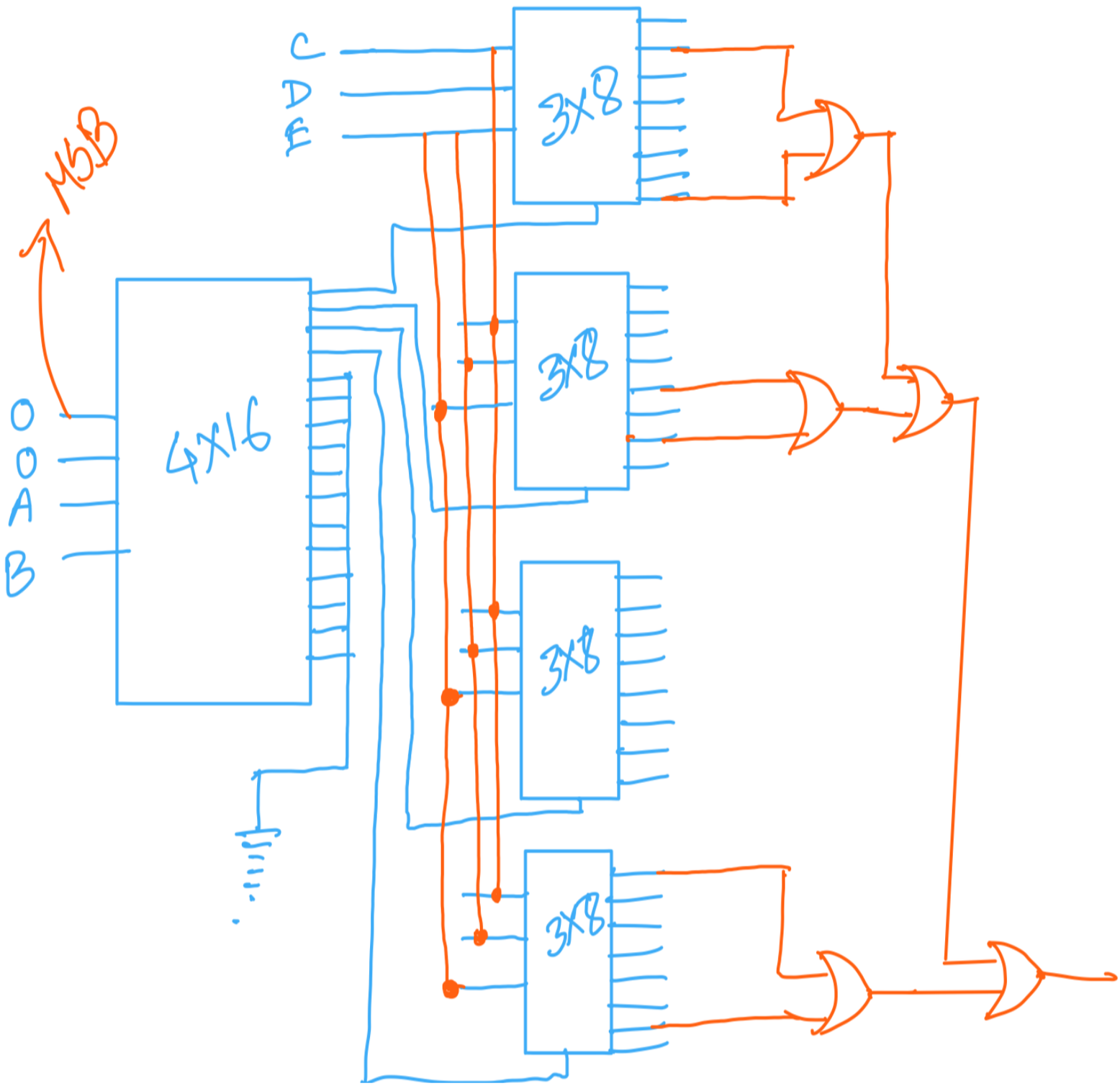
# 2

| | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ | $I_6$ | $I_7$ |
|---|---|---|---|---|---|---|---|---|
| $A'$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| $A$ | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 0 | 1 | $A'$ | 0 | $A'$ | $A'$ | $A$ | $A$ |



| | |
|---|---|
| 1.CO3 | **Build** the following function using both 4x16 decoder(s) and 3x8 decoder(s) in a single circuit:<br>F(A,B,C,D,E)=Σ (1, 7, 12, 14, 24, 30)<br>In your circuit, the number of 4x16 decoder(s) must be less than the number of 3x8 decoder(s). |
| 2.CO3 | **Implement** the boolean function using only one 8X1 mux .<br>F(A,B,C,D) = ∑ (2,1,4,5,9,14,15) |

1



2

| | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ | $I_6$ | $I_7$ |
|---|---|---|---|---|---|---|---|---|
| $A'$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| $A$ | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 0 | 1 | $A'$ | 0 | $A'$ | $A'$ | $A$ | $A$ |