Date:

# EXPERIMENT NO. 4

#### AIM: Implement arithmetic and logic unit circuits in Logisim.

#### OBJECTIVES:

#### Implement 1-bit, 2-bit, 4-bit and 8-bit arithmetic unit circuits

#### Implement 1-bit, 2-bit, 4-bit and 8-bit logical unit circuits for four logical functions

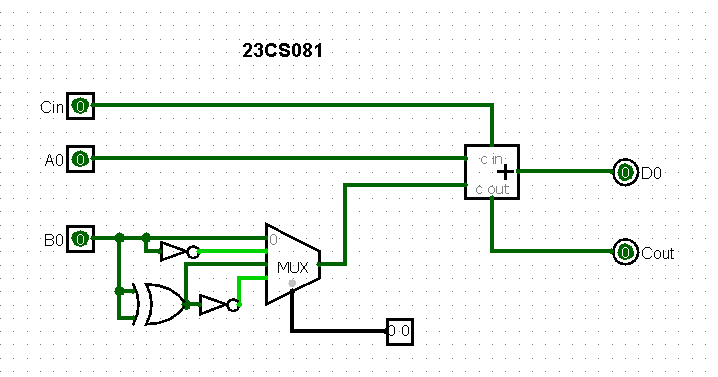
#### Implement 1-bit and 2-bit logical unit circuits for sixteen logical functions

#### Implement 2-bit, 4-bit and 8-bit bidirectional shifter

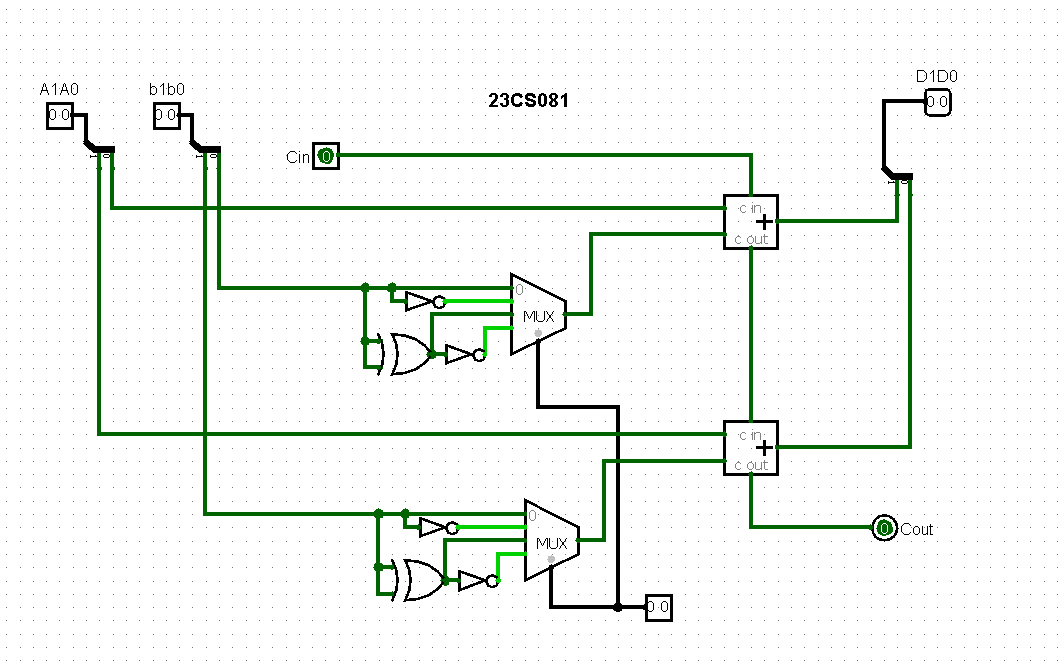
#### Implement 1-bit, 2-bit, 4-bit and 8-bit ALU

**CIRCUITS:**

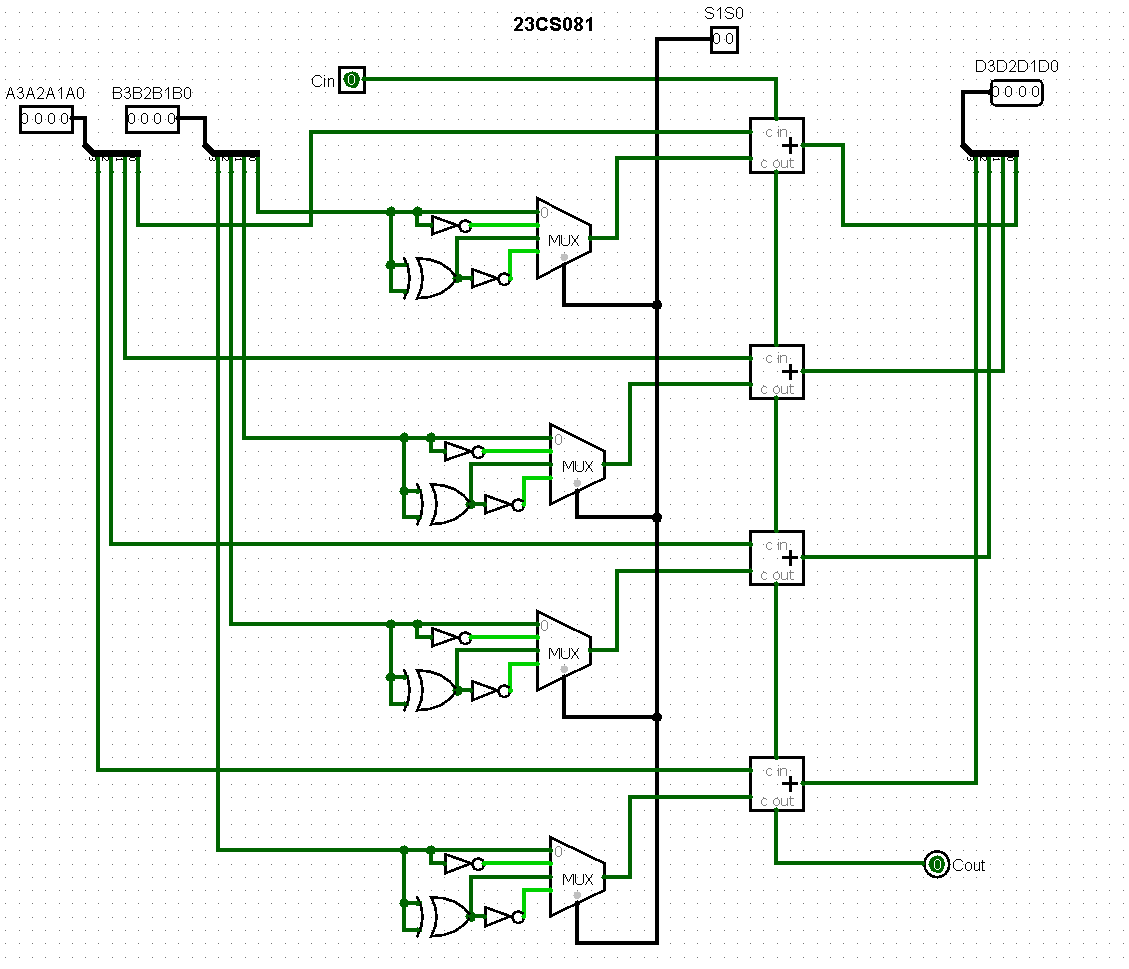
1. **1-bit arithmetic unit circuit**

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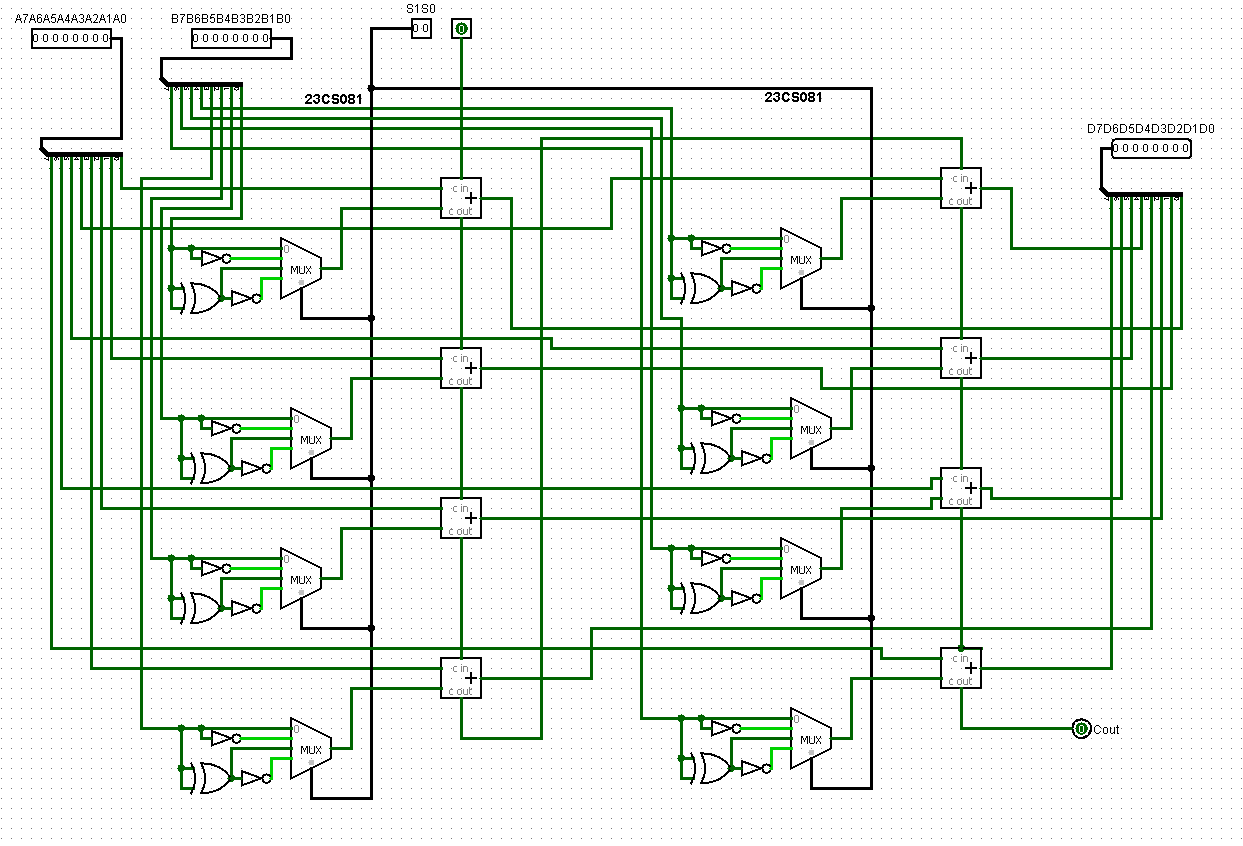
1. **2-bit arithmetic unit circuit**

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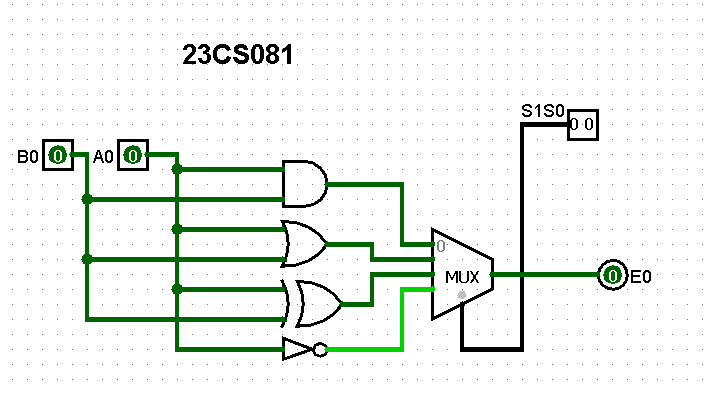
1. **4-bit arithmetic unit circuit**

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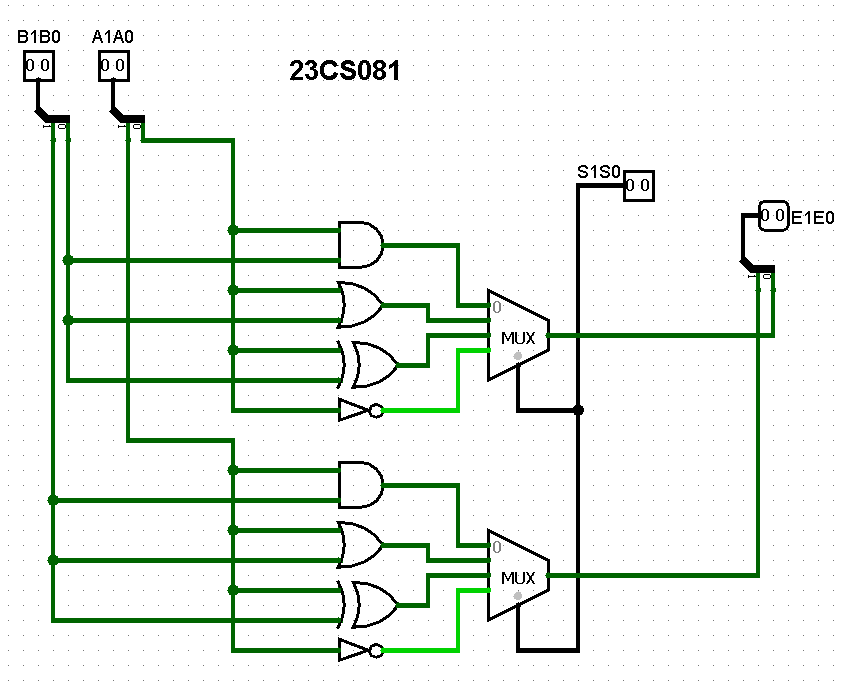
1. **8-bit arithmetic unit circuit**

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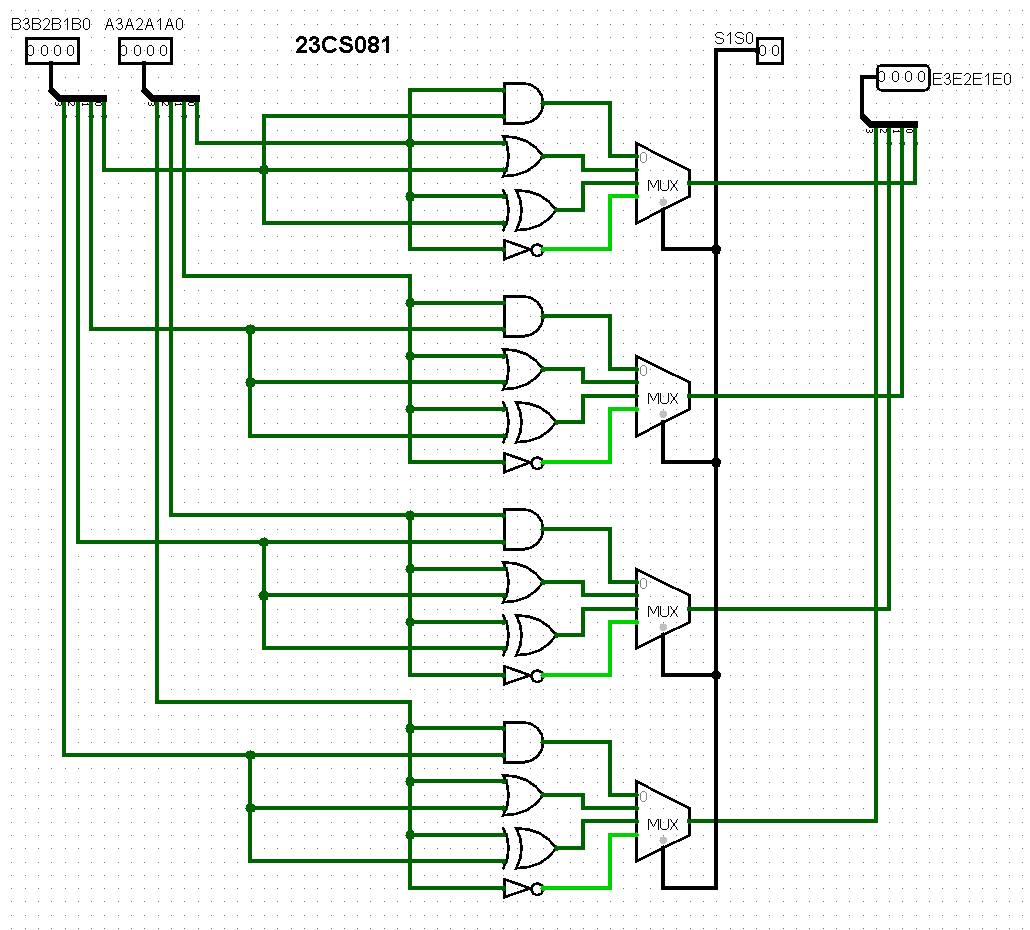
#### 1-bit logical unit circuits for four logical functions

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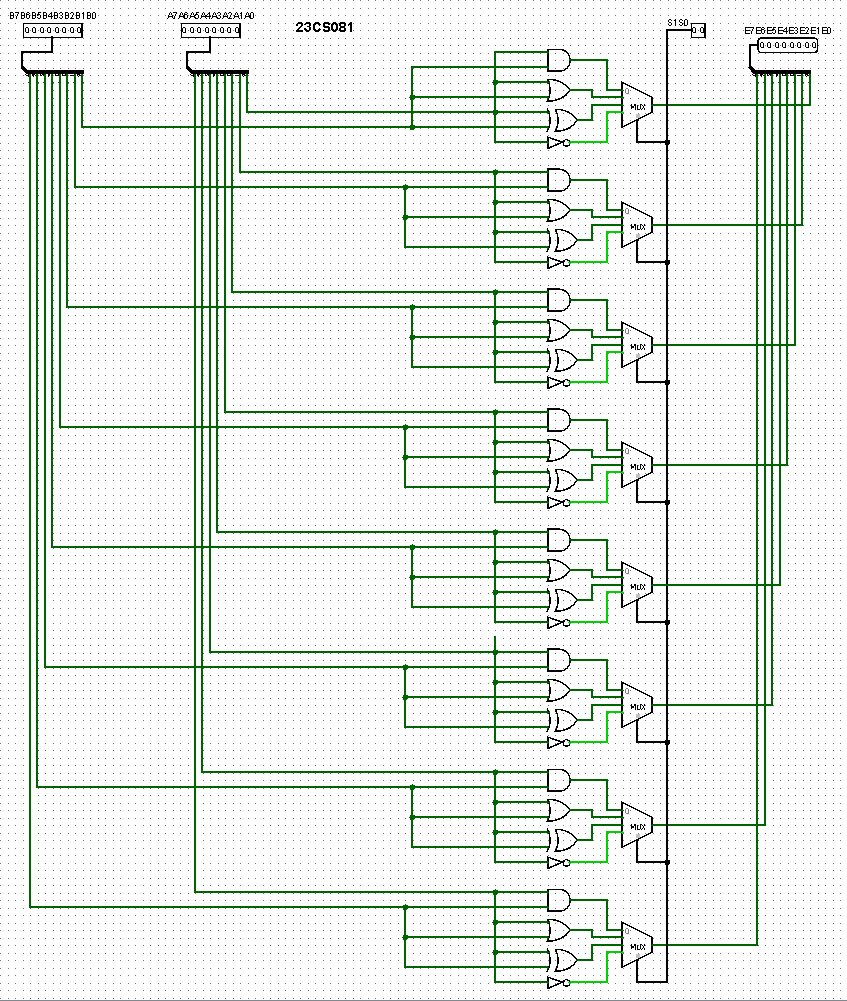
1. **2-bit logical unit circuits for four logical functions**

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**3. 4-bit logical circuits for four logical functions**

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**4. 8-bit logical circuits for four logical functions**

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#### 1-bit logical unit circuits for sixteen logical functions

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#### 2-bit logical unit circuits for sixteen logical functions

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#### Implement 2-bit bidirectional shifter

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#### Implement 4-bit bidirectional shifter

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#### Implement 8-bit bidirectional shifter

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#### Implement 1-bit ALU

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#### Implement 2-bit ALU

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#### Implement 4-bit ALU

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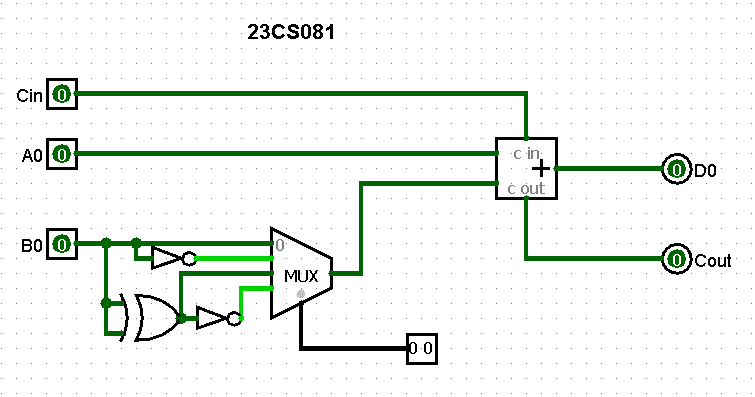
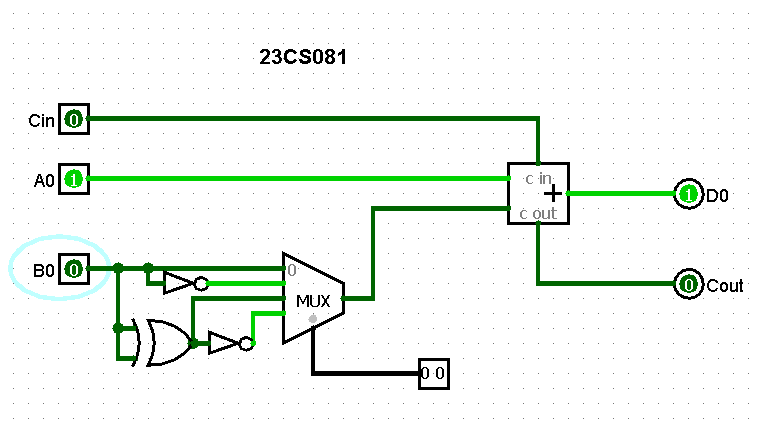
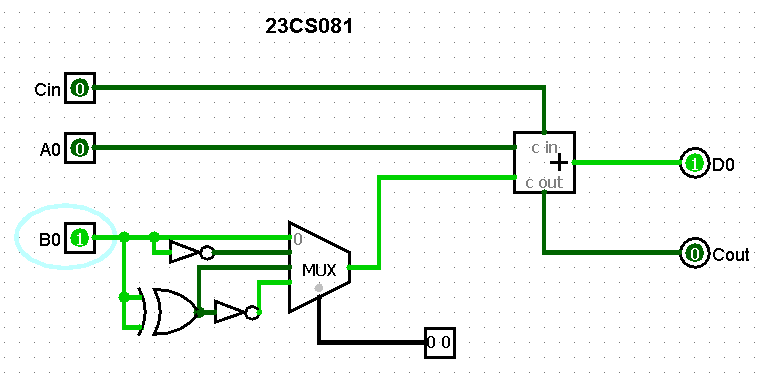
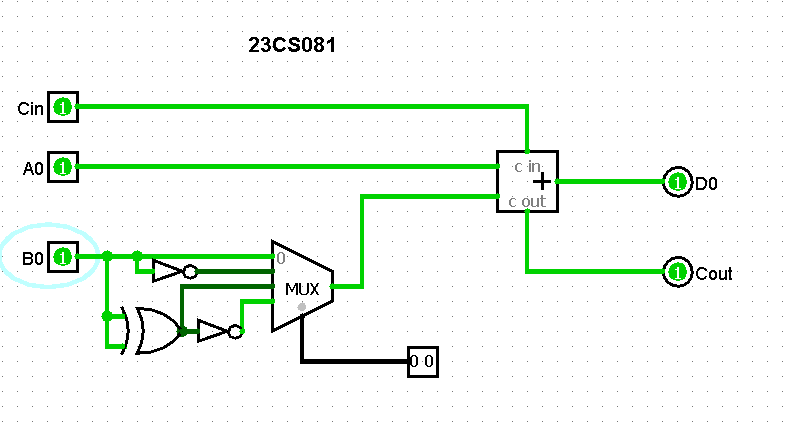
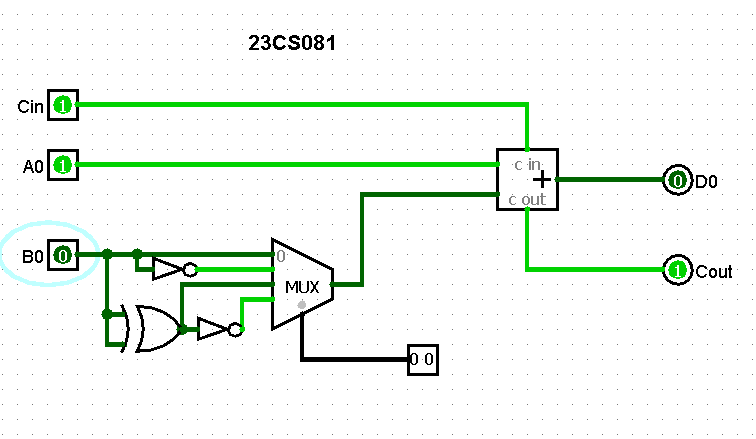
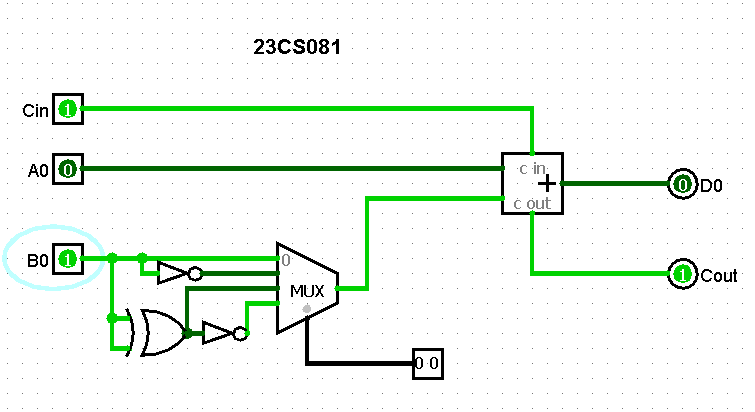
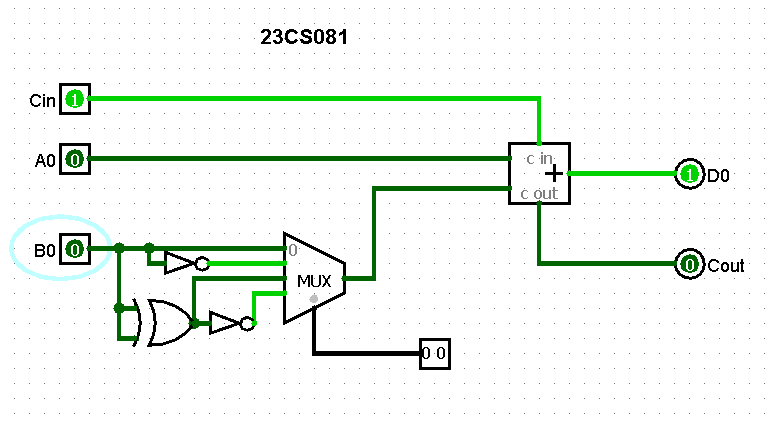
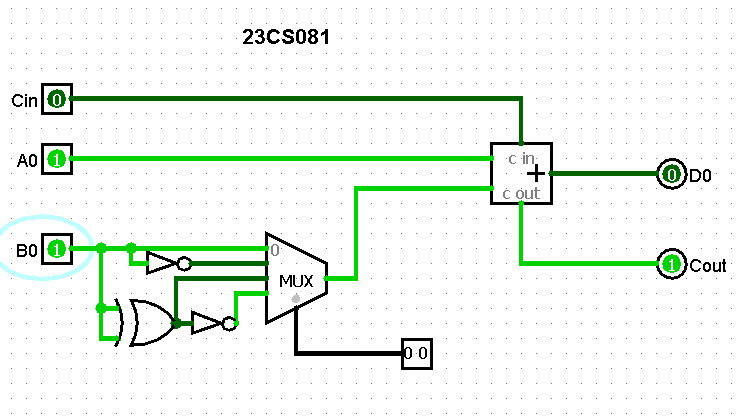
#### Implement 8-bit ALU

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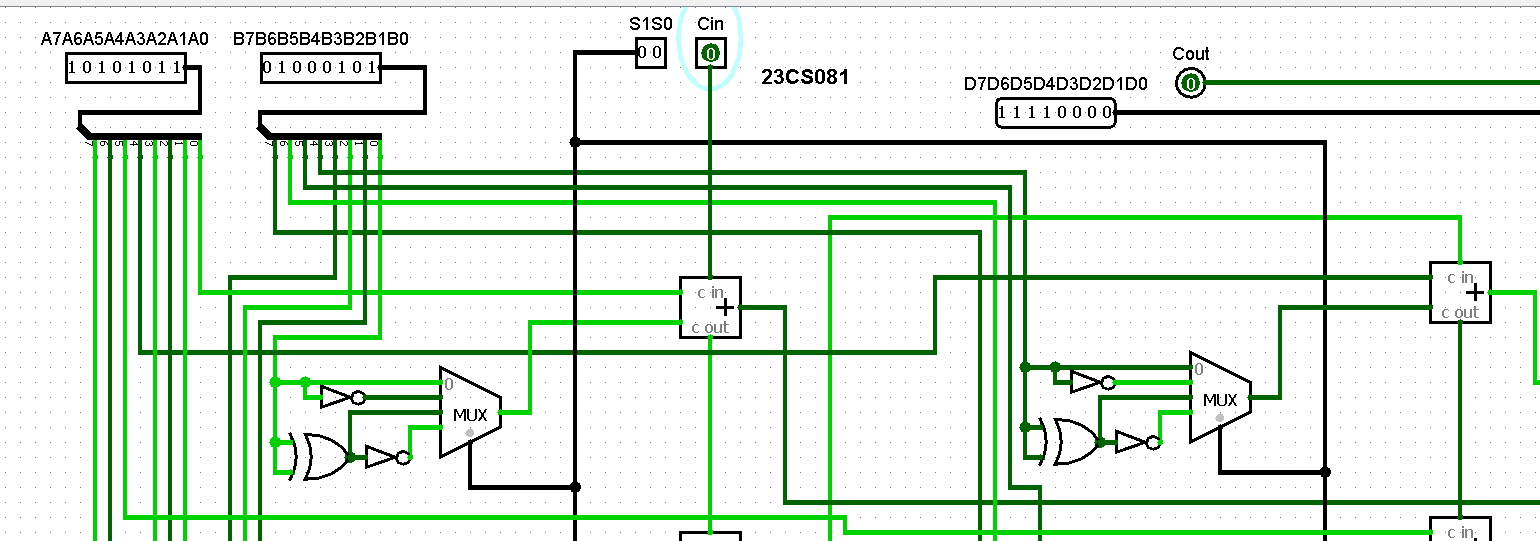
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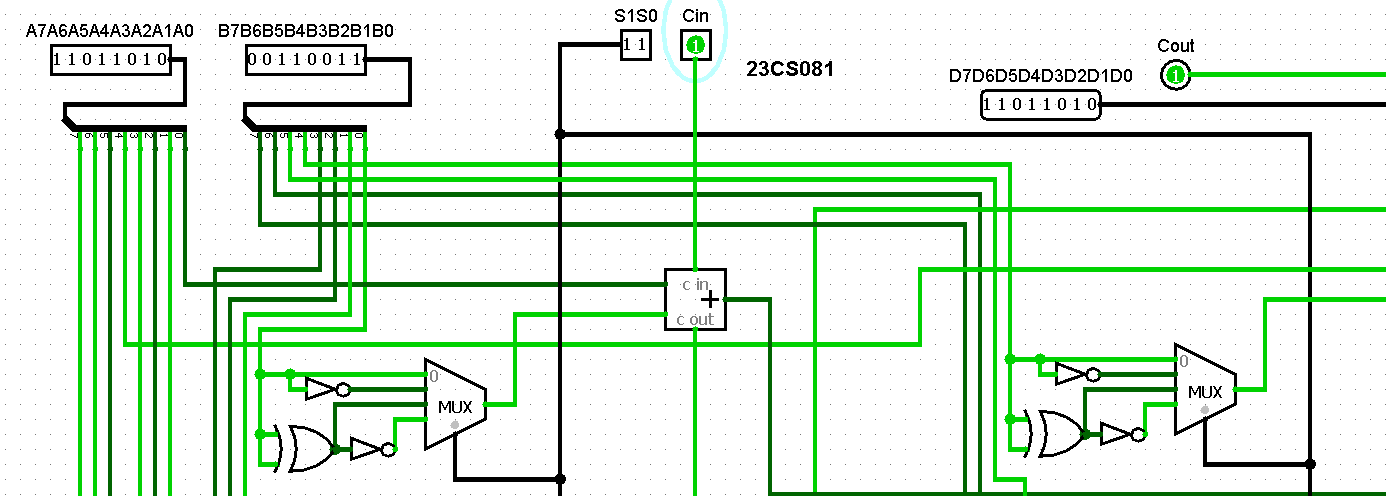
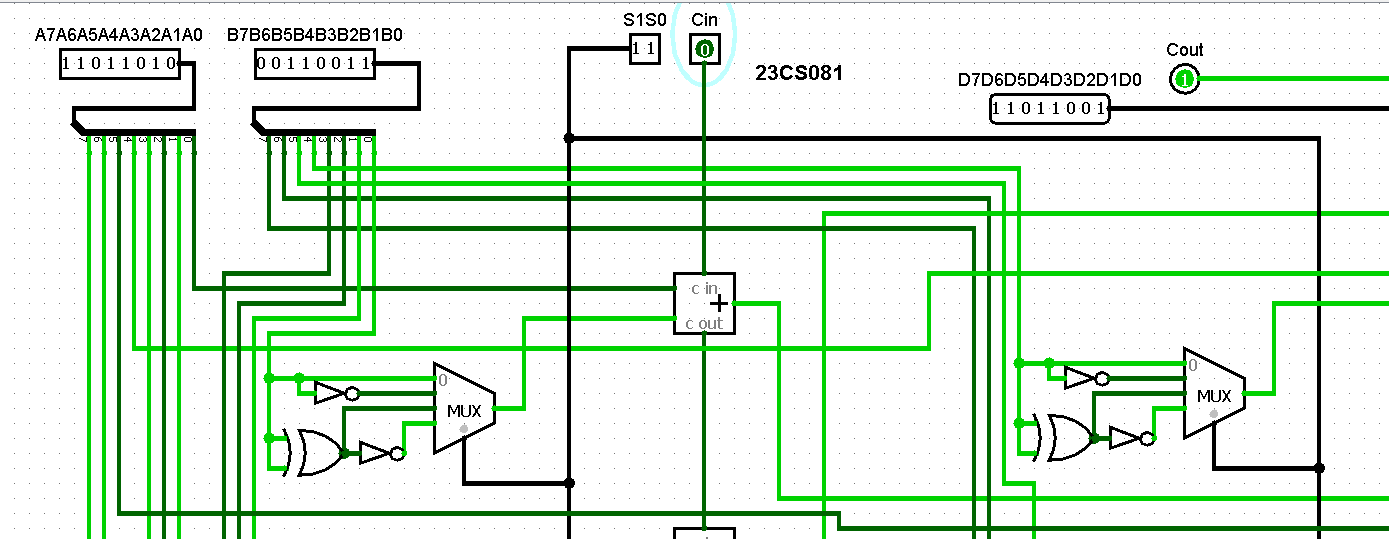
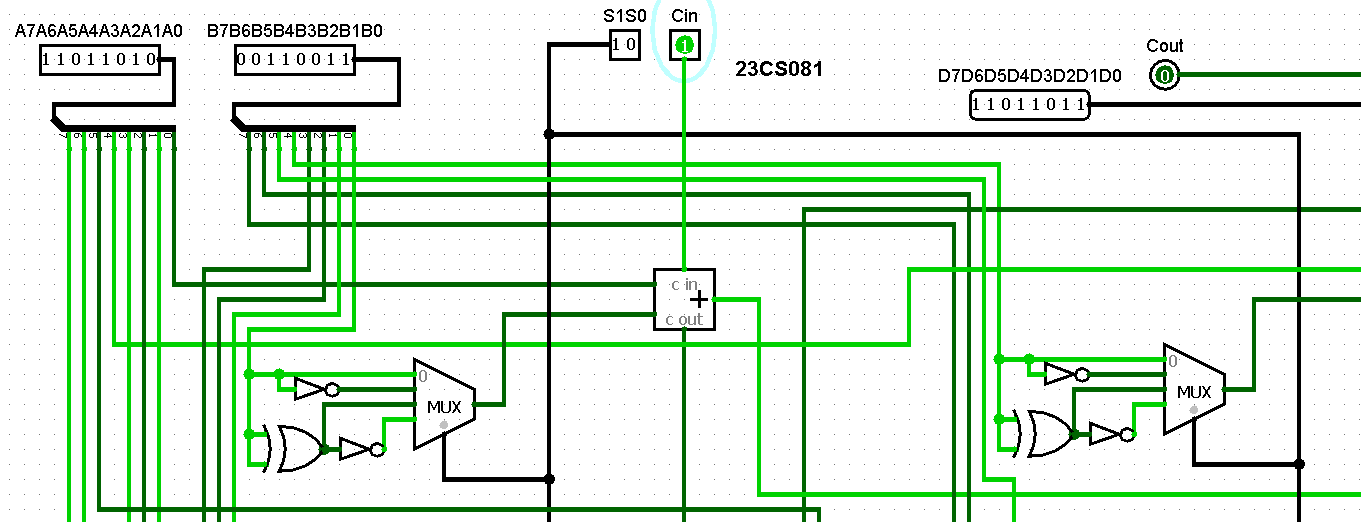
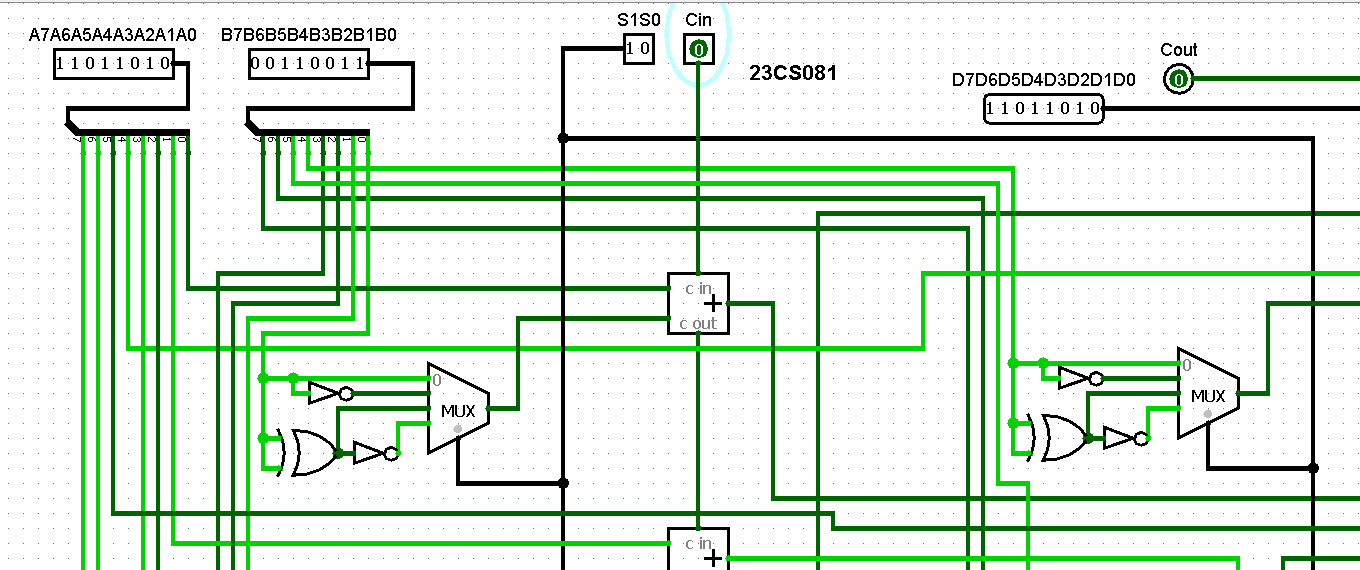
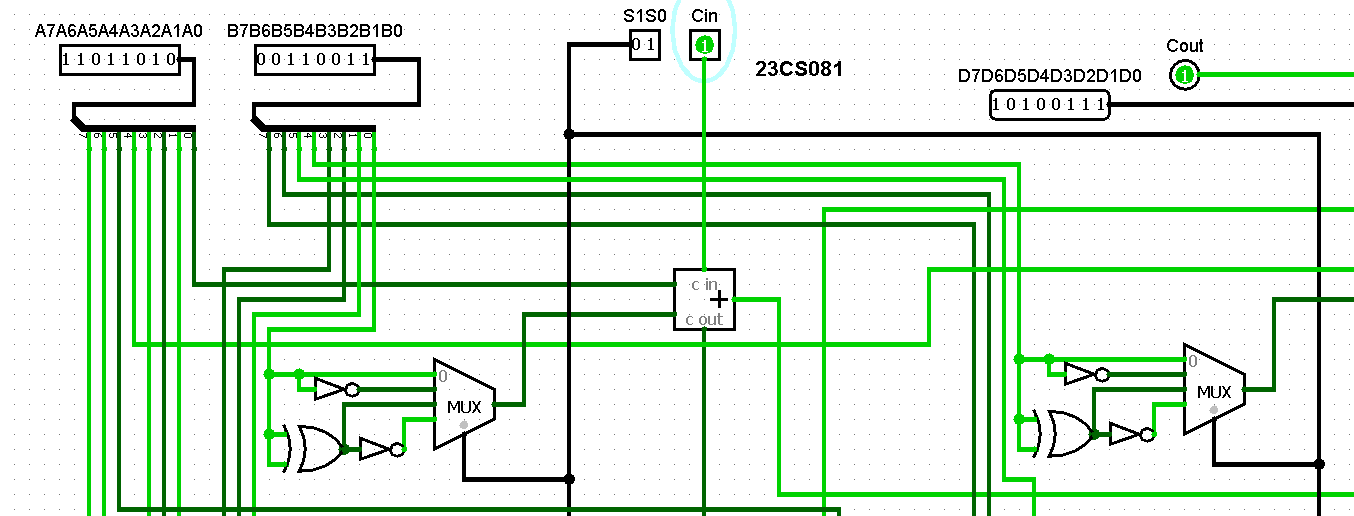
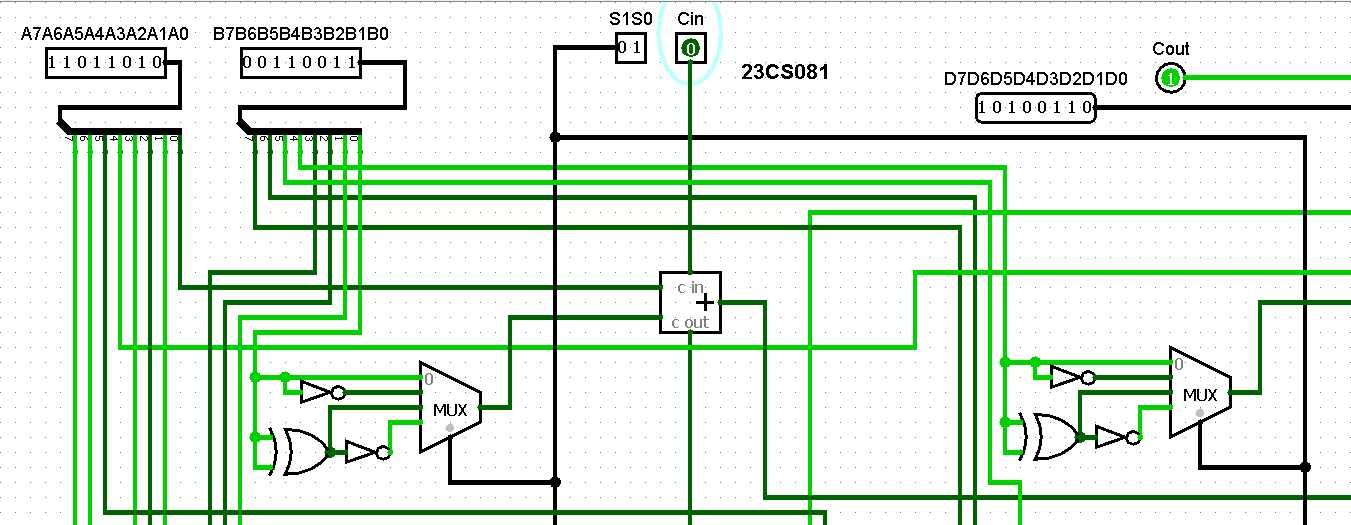
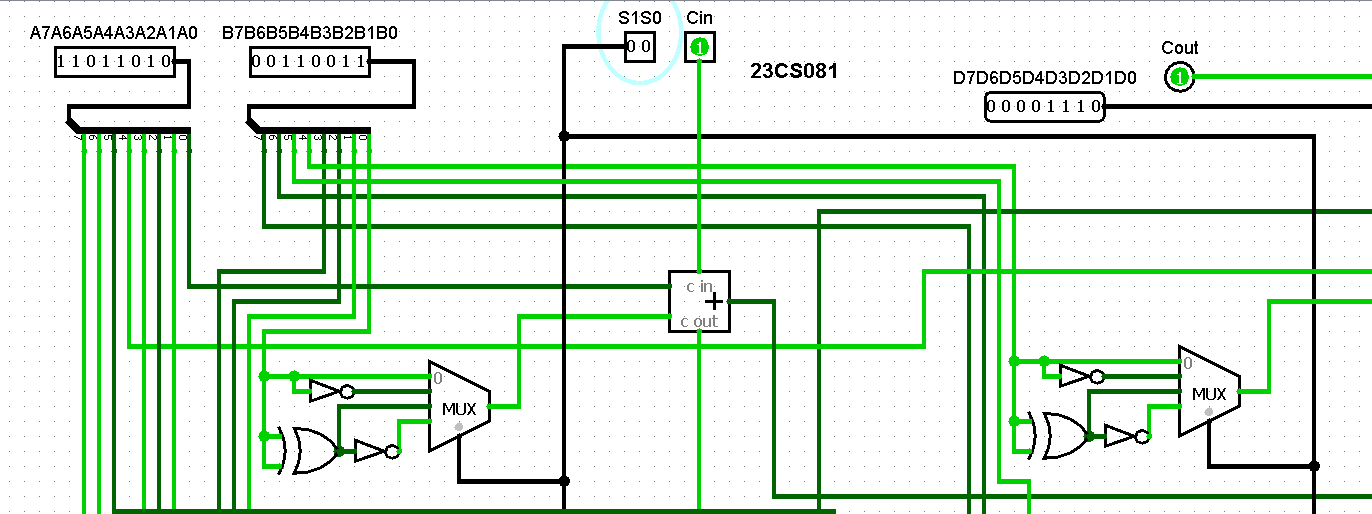
**OUTPUTS:**

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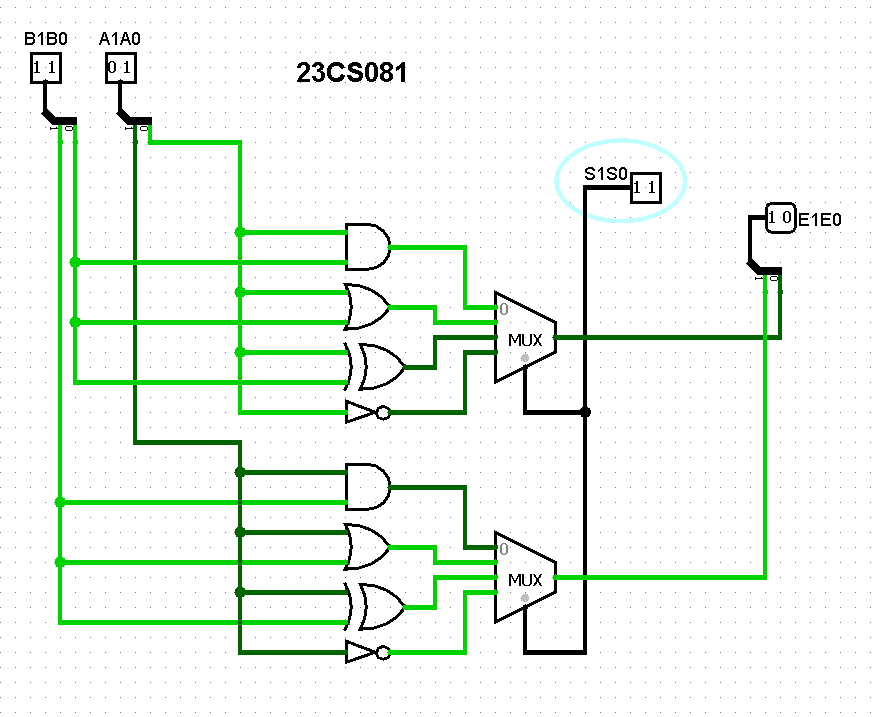
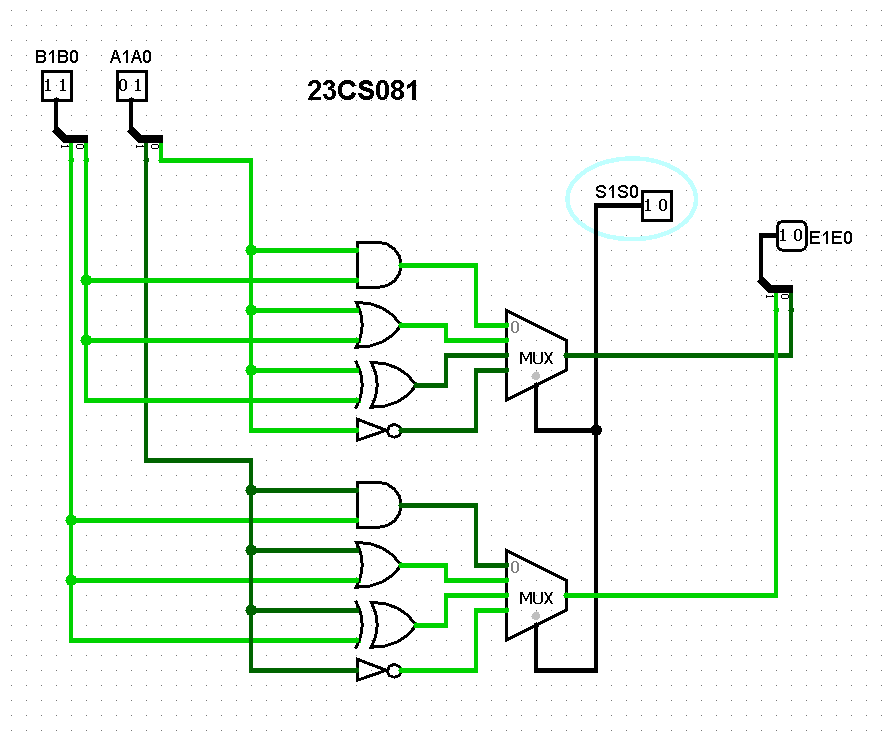
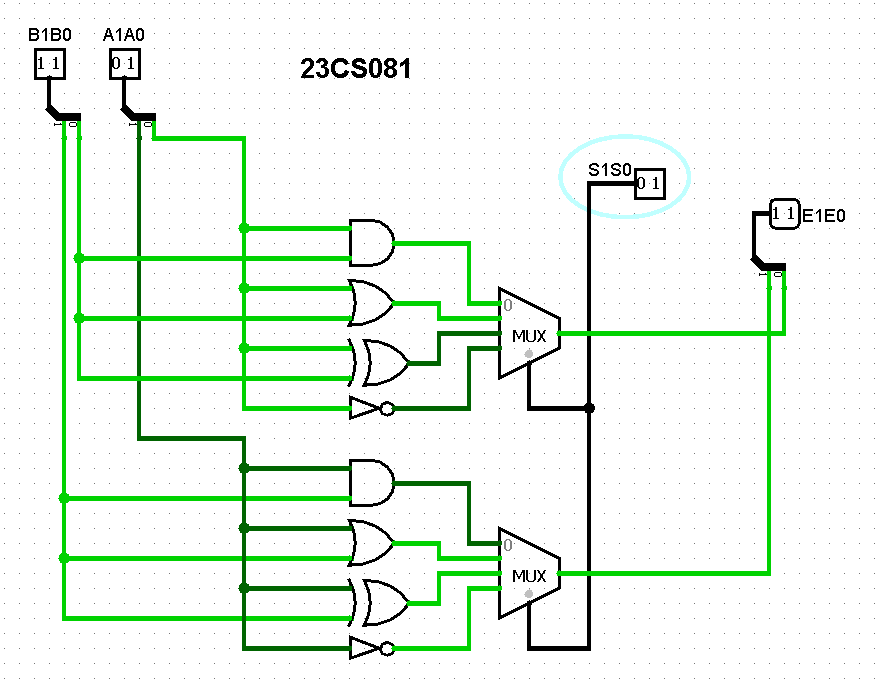
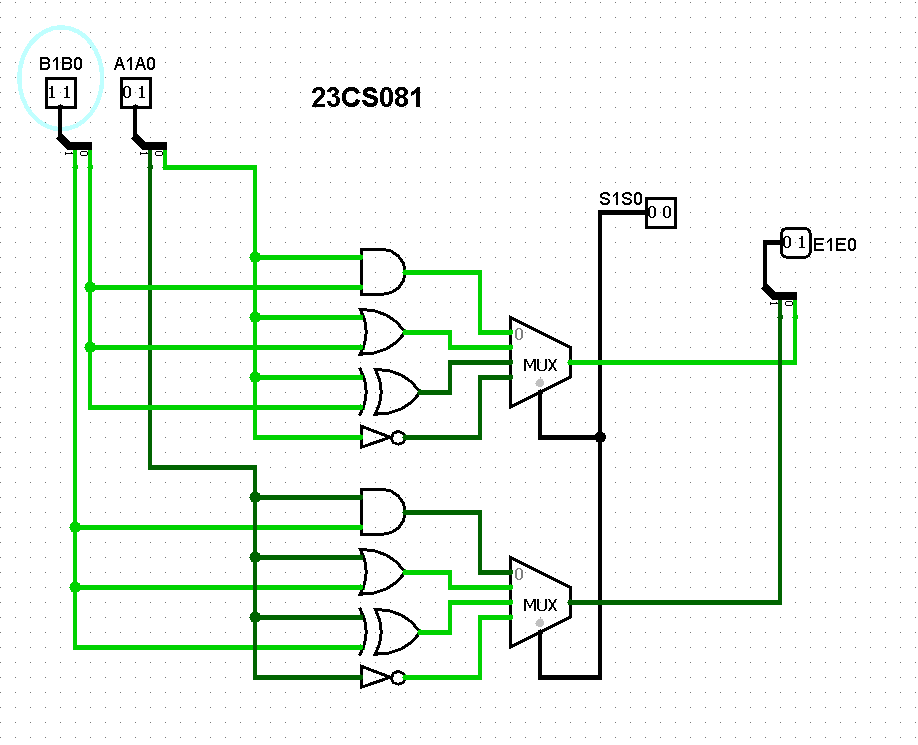
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1. **8-bit arithmetic unit circuit**

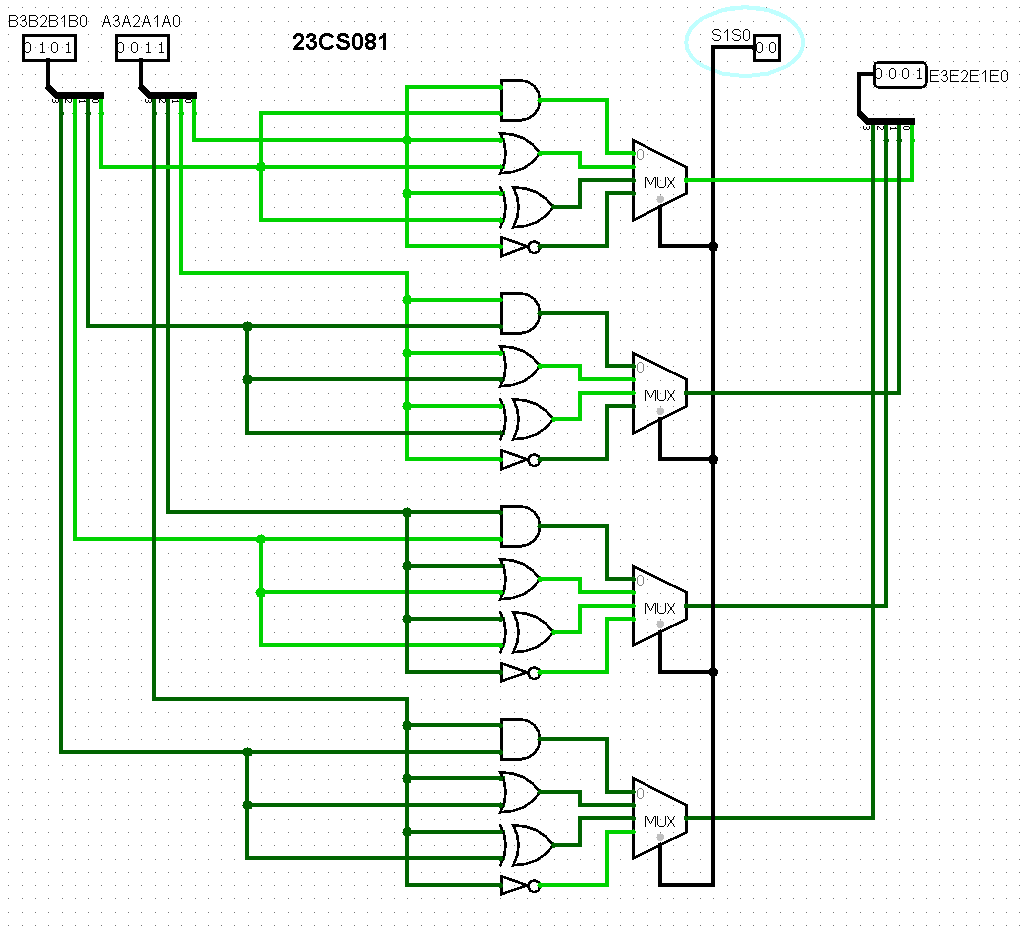
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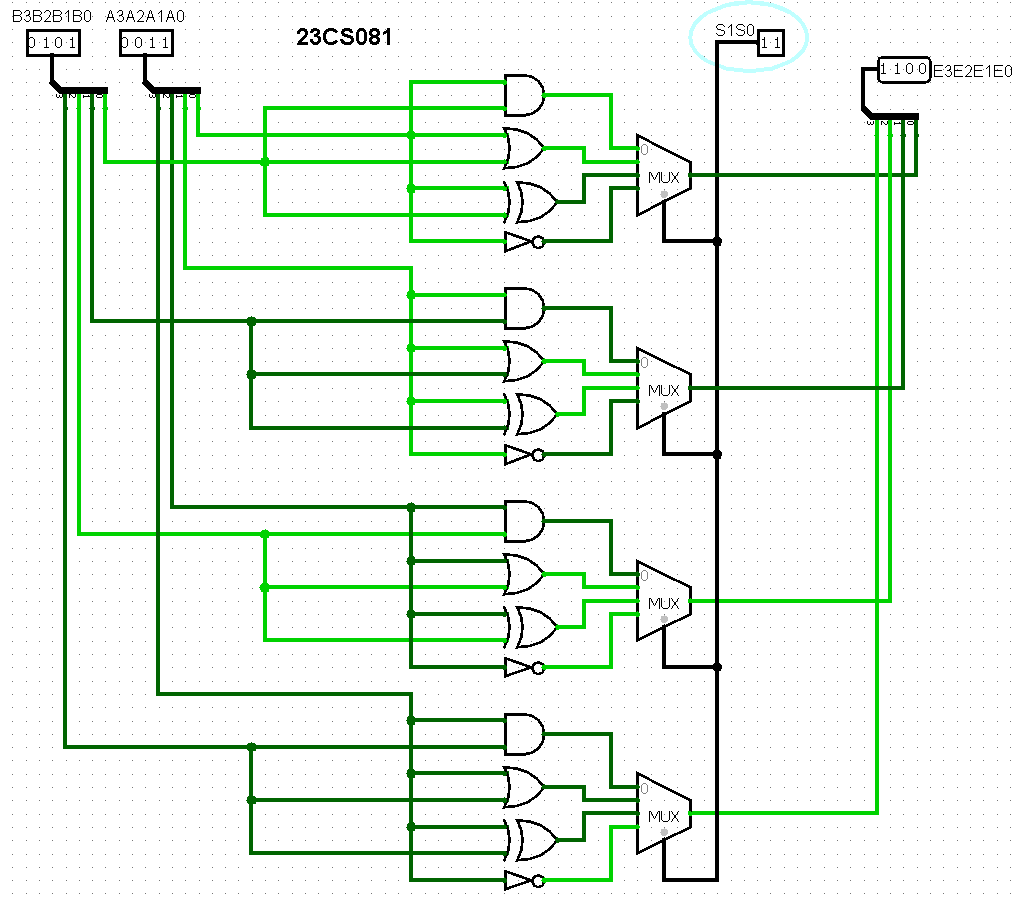
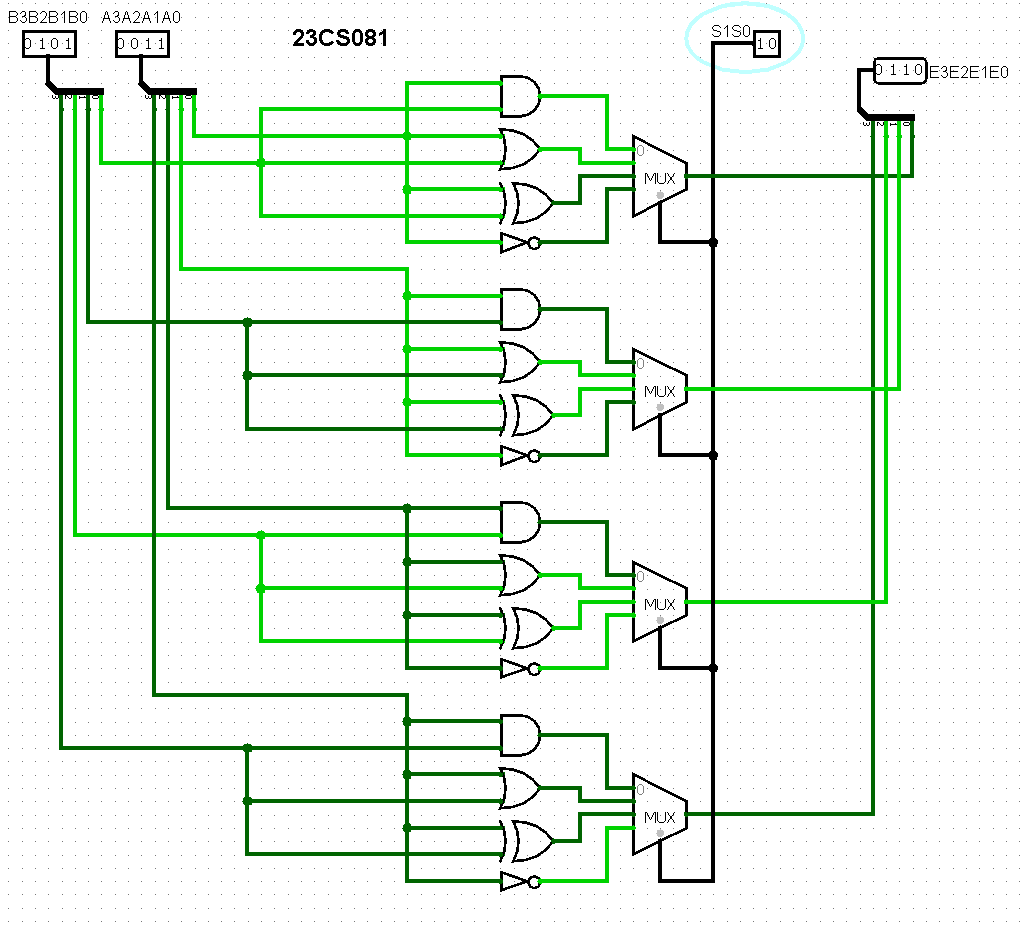
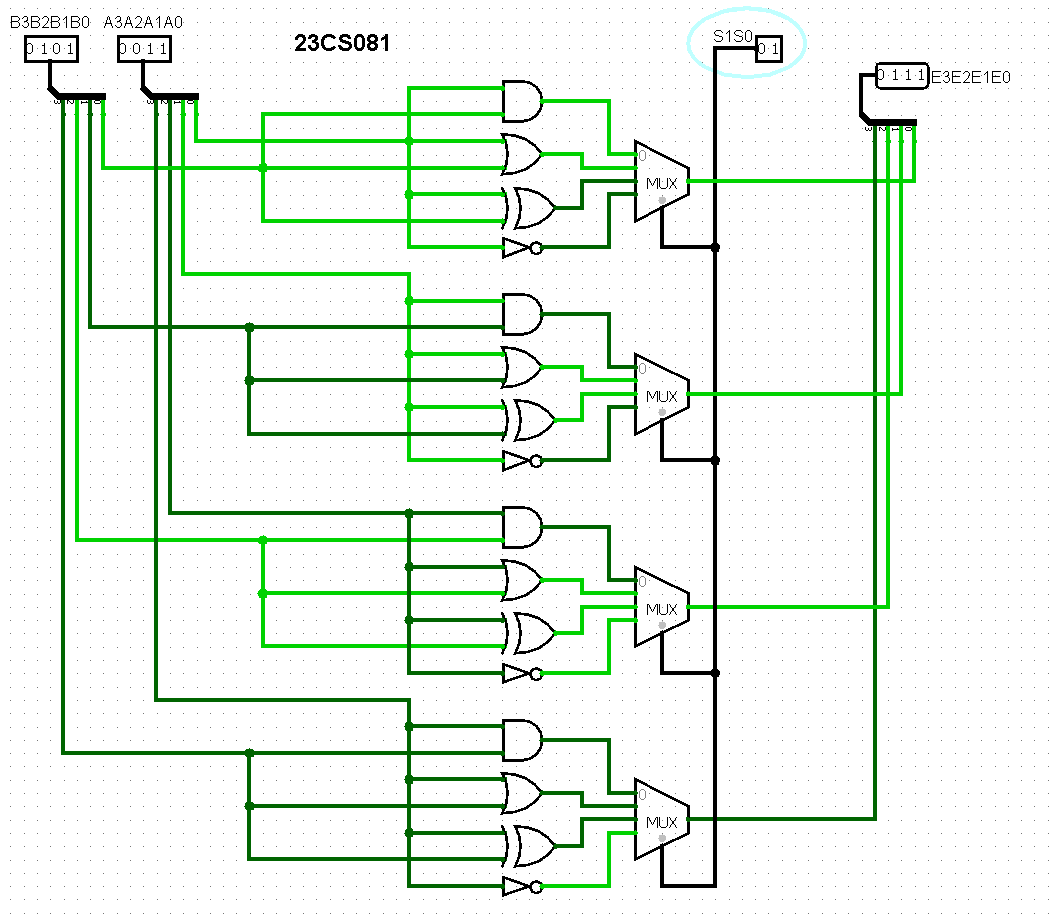
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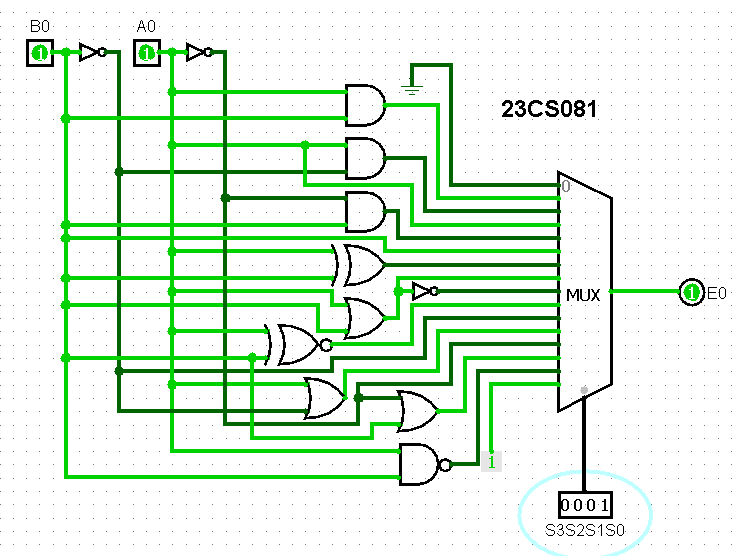
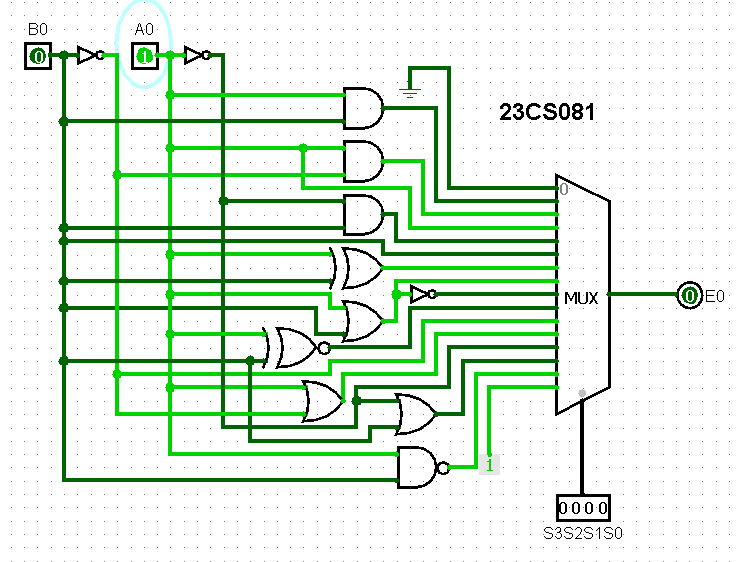
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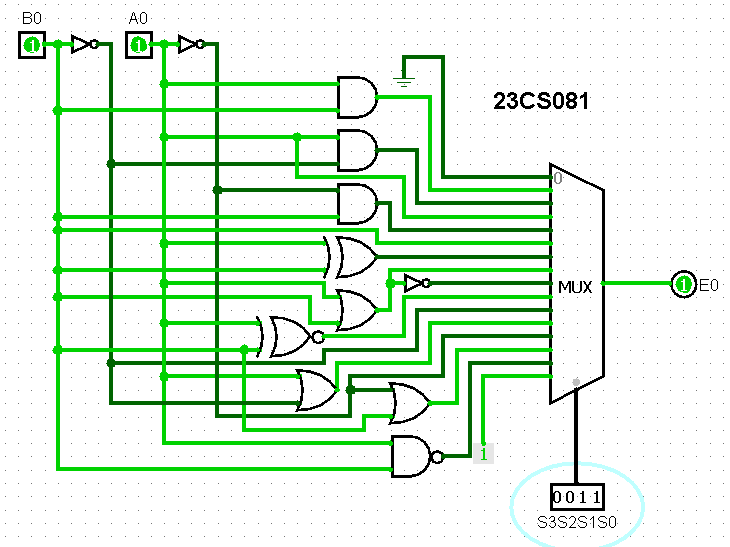
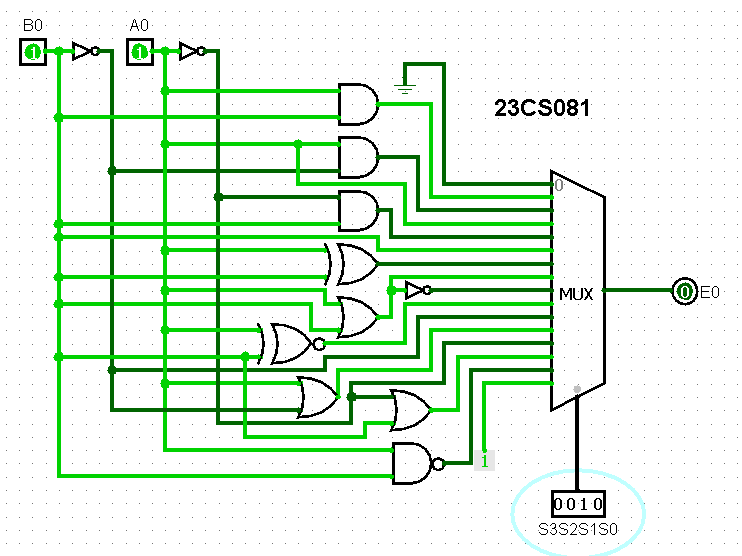
**4. 4-bit logical circuits for four logical functions**

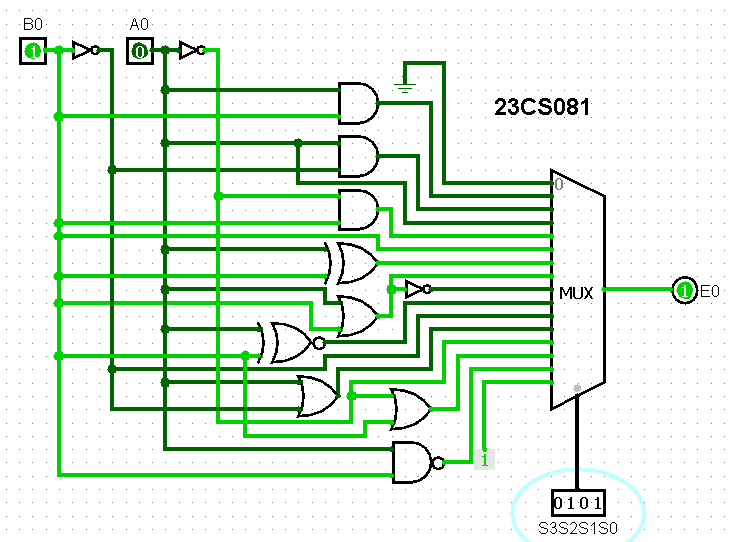
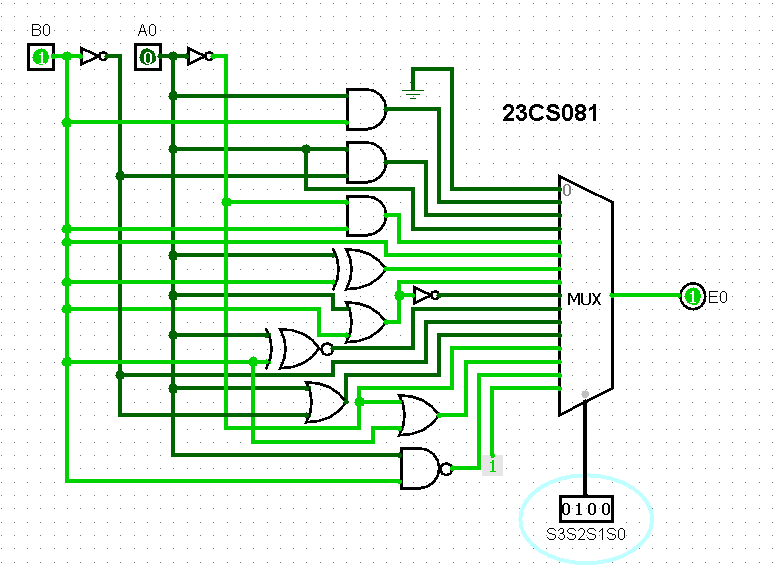
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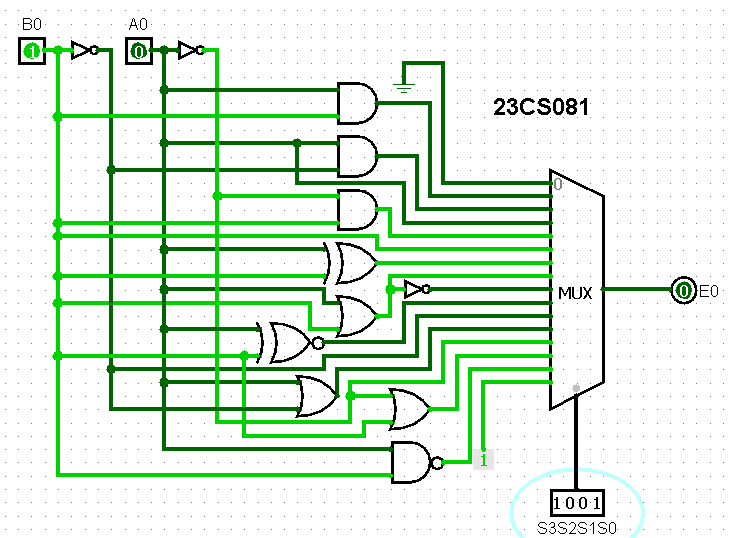
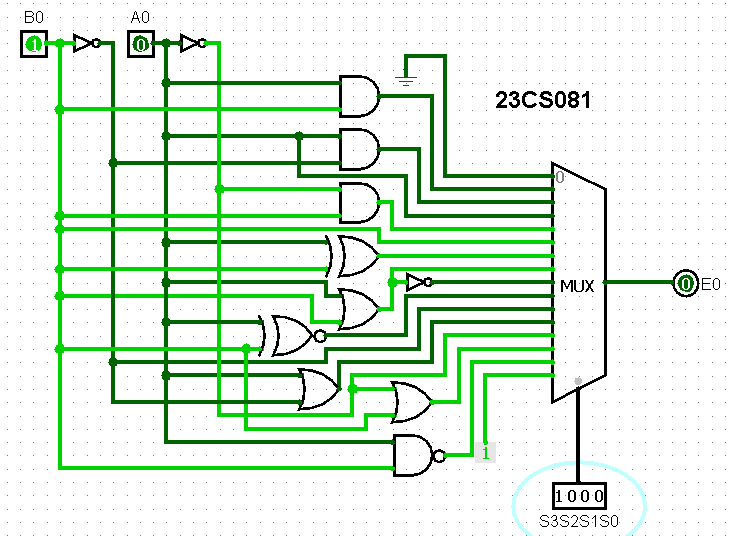
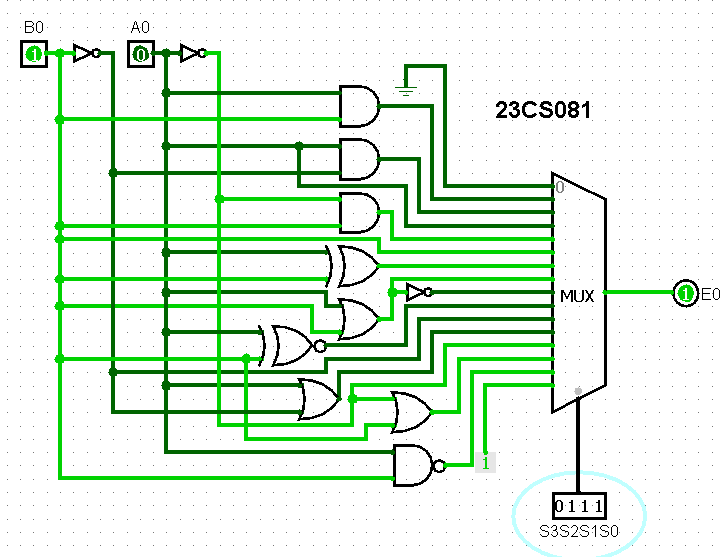
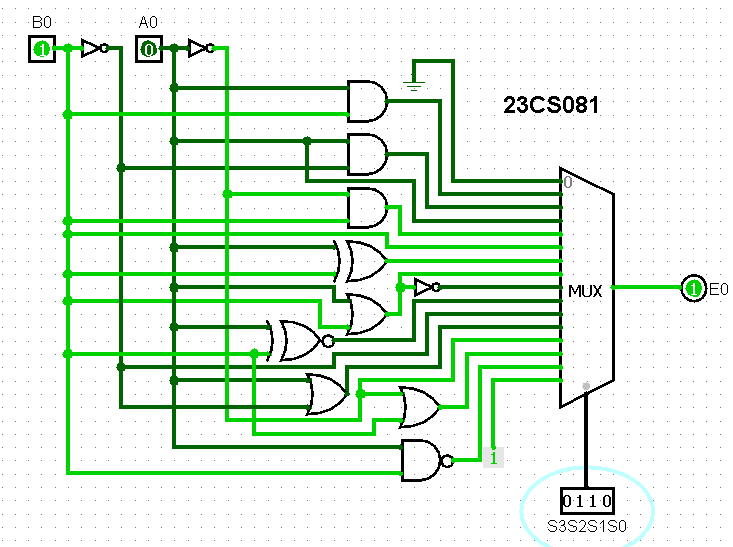
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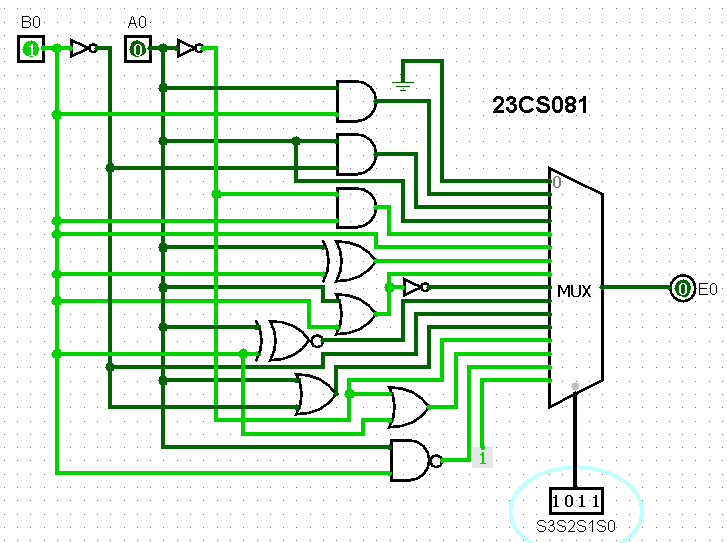
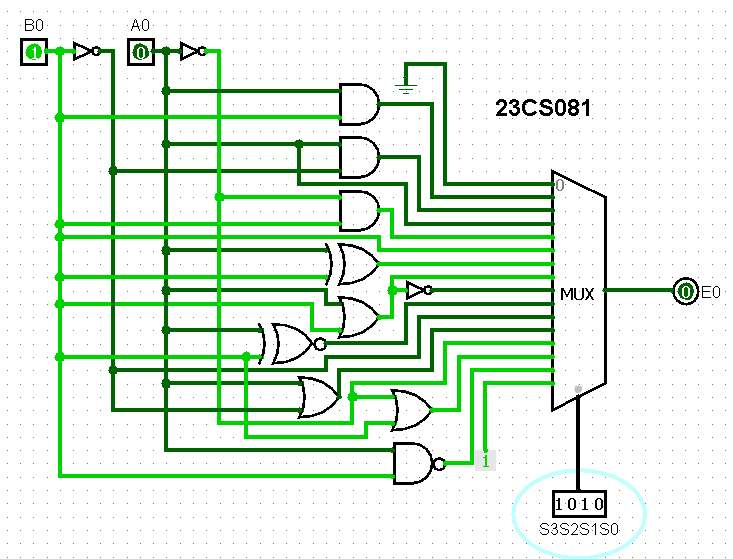
#### 1-bit logical unit circuits for sixteen logical functions

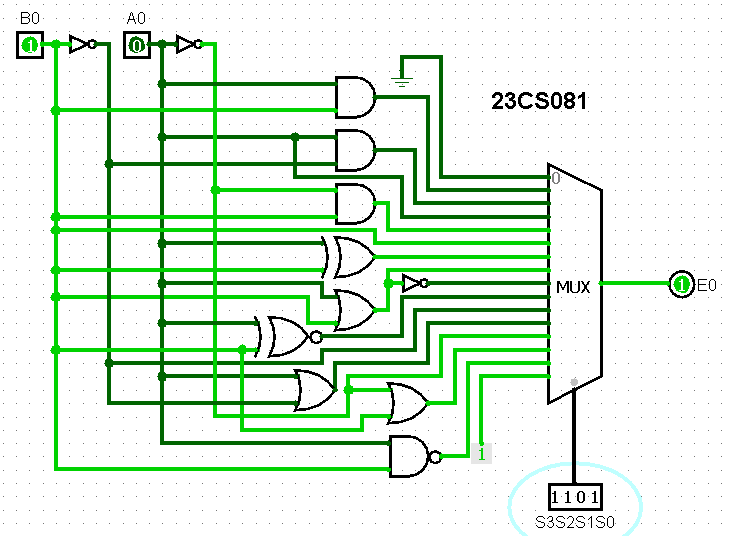
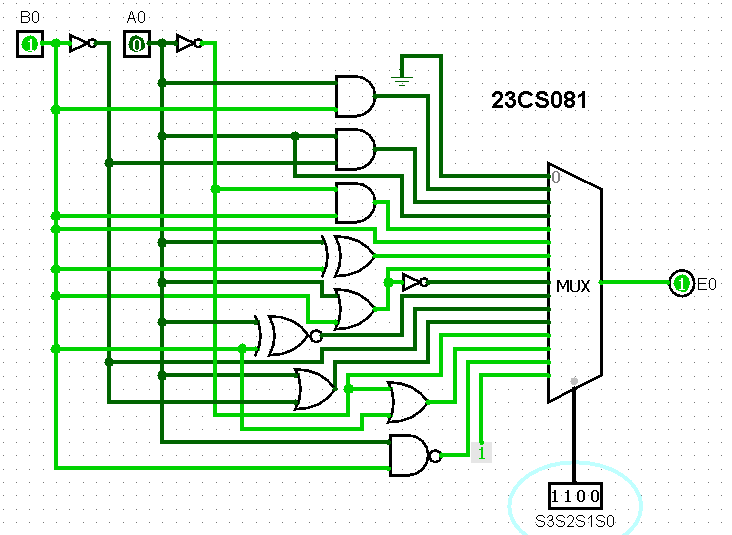
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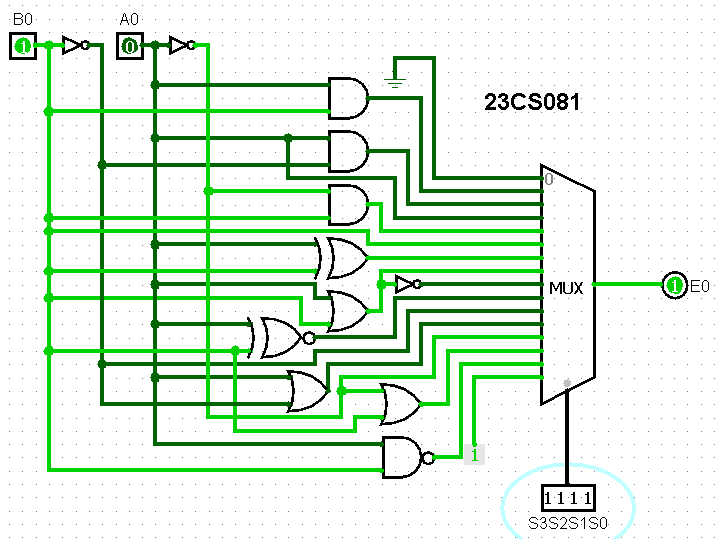
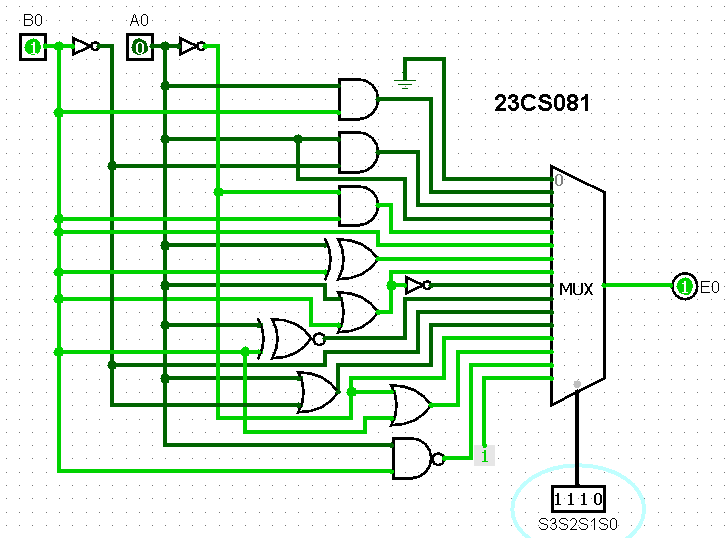
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#### Implement 2-bit bidirectional shifter

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#### Implement 4-bit bidirectional shifter

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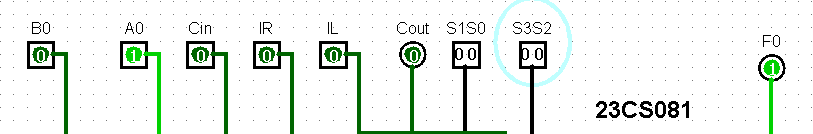
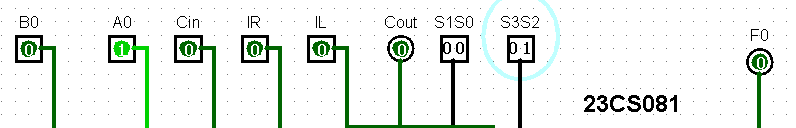
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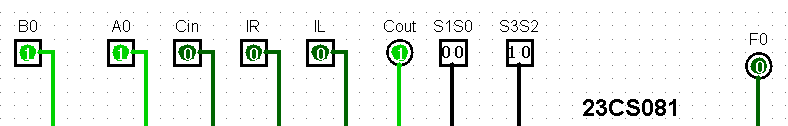
#### 8-bit bidirectional shifter

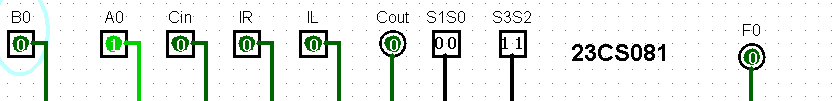
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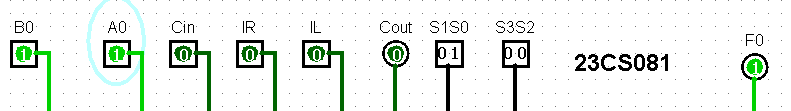
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#### 1-bit ALU

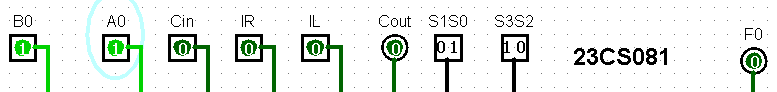
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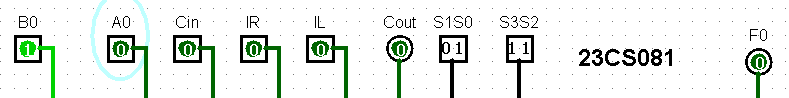
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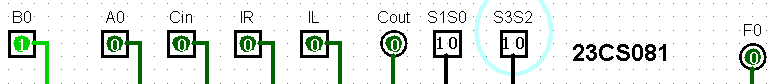
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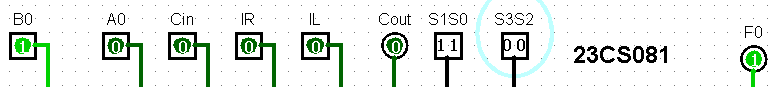
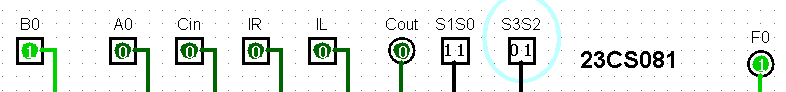
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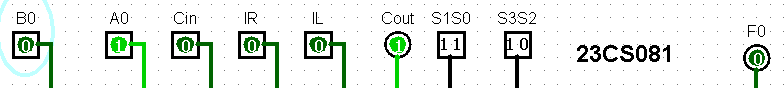
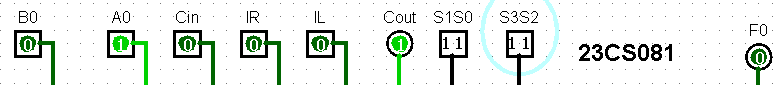
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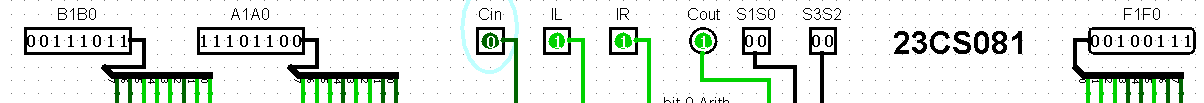
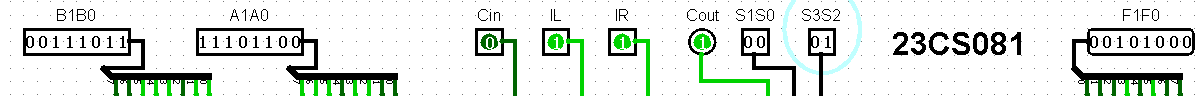
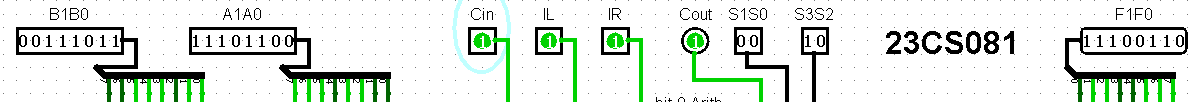
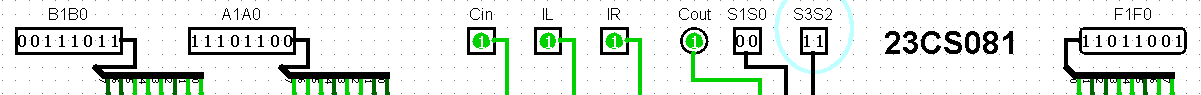
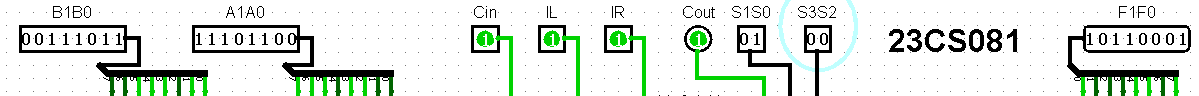
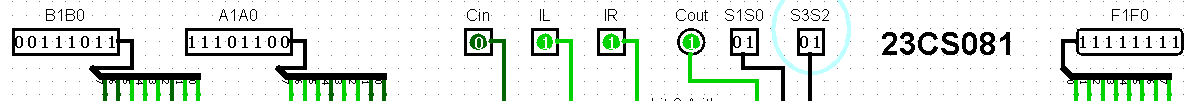
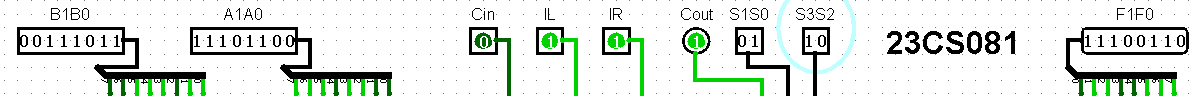
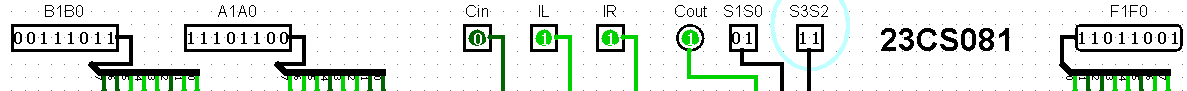
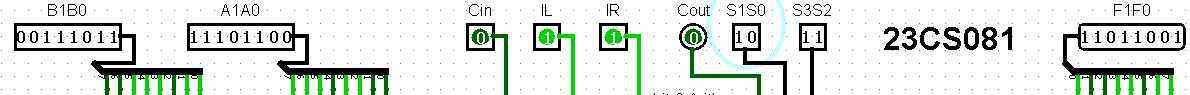
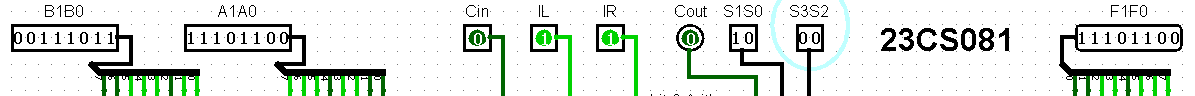
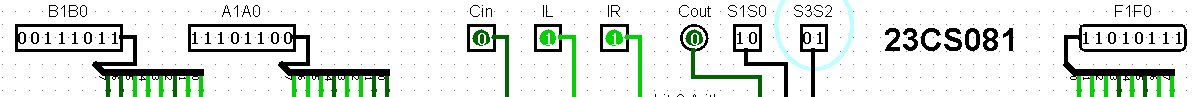
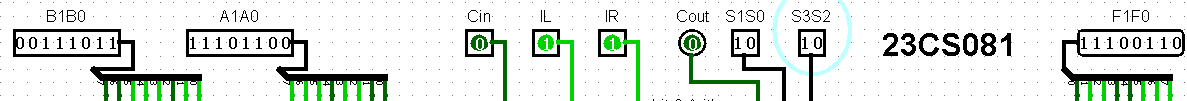
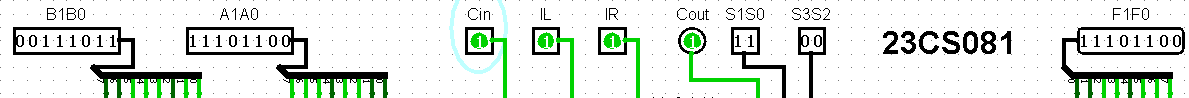
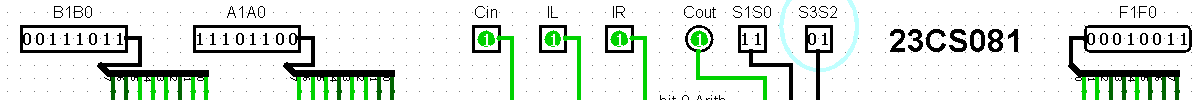
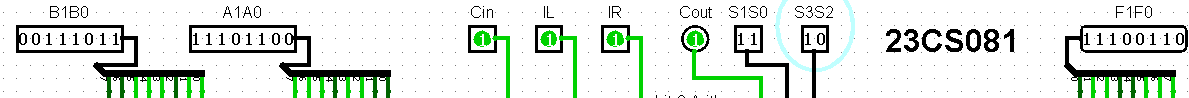
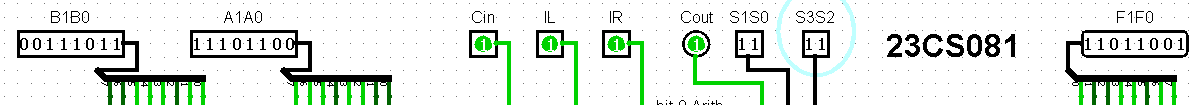
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1. **8-bit ALU**

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**CONCLUSION:**