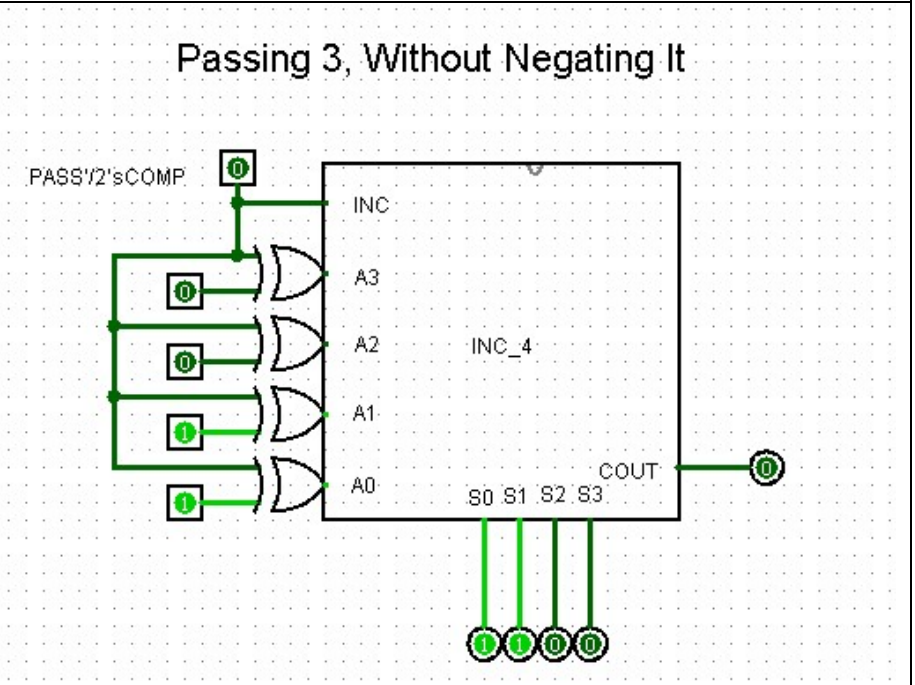
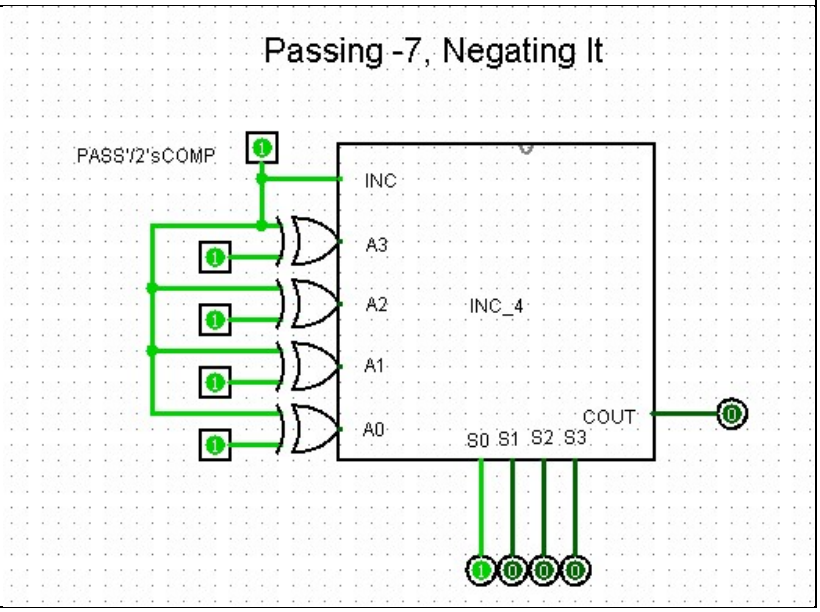
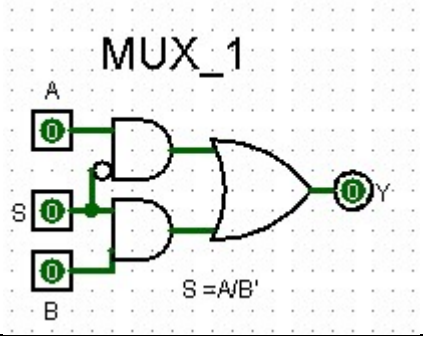
Andrew Durkiewicz
SW 2

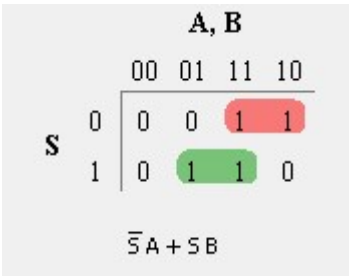
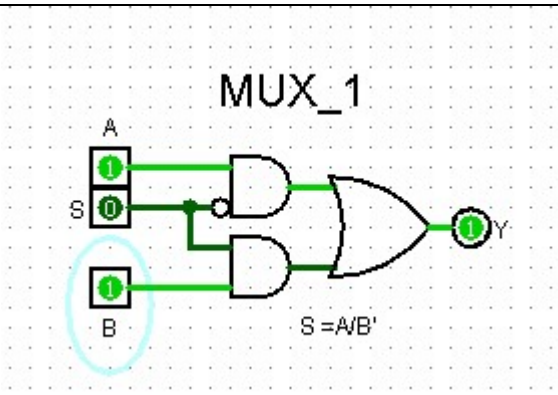
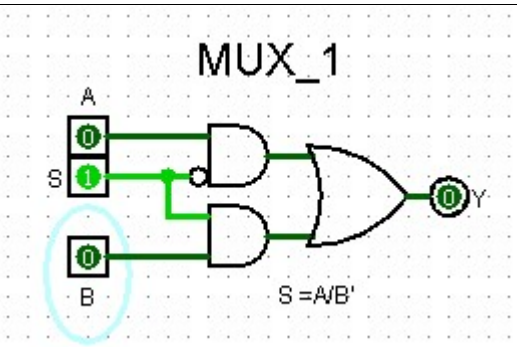
Task 1:

[Negate.cct]	
Schematic	
Test Cases [Pass 3 (0011)] with complement switch off	
Test Cases [Pass -7 (1111)] with complement switch set on	

Truth Table for Suggested Case: “. Show an input of 3, and set the circuit not to negate it. Then, show an input of 7, with the circuit set to negate it”		S	A3	A2	A1	A0	S0	S1	S2	S3	COUT
	A/B’ = 1	1	1	1	1	1	1	0	0	0	0
	A/B’ = 0	0	0	0	1	1	1	1	0	0	0

Task 2:

[MUX_1.cct]	
Schematic	
SOP Equation	$Y = \bar{S}A + SB$
Truth Table	S A B Y 0 0 0 0 0 0 1 0 0 1 0 1 0 1 1 1 1 0 0 0 1 0 1 1 1 1 0 0 1 1 1 1

<table>
<tr><td colspan="2">K-Map (Y)</td><td colspan="3"> 
</td></tr>
<tr><td colspan="5">Test Cases</td></tr>
<tr><td>S = 0</td><td>A = 1</td><td>B = 1</td><td>Y = 1</td><td> 
</td></tr>
<tr><td>S = 1</td><td>A = 0</td><td>B = 0</td><td>Y = 0</td><td> 
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<tr><td colspan="5"></td></tr>
<tr><td colspan="5">[MUX_4.cct]</td></tr>
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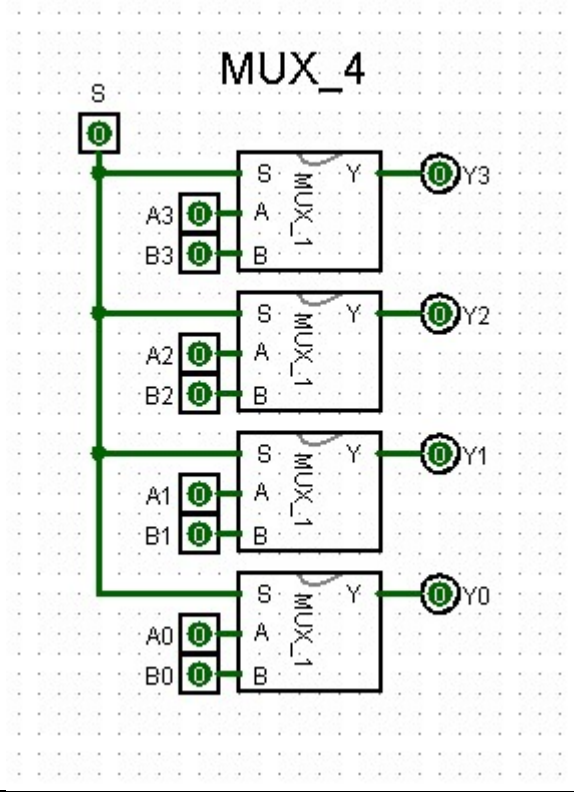
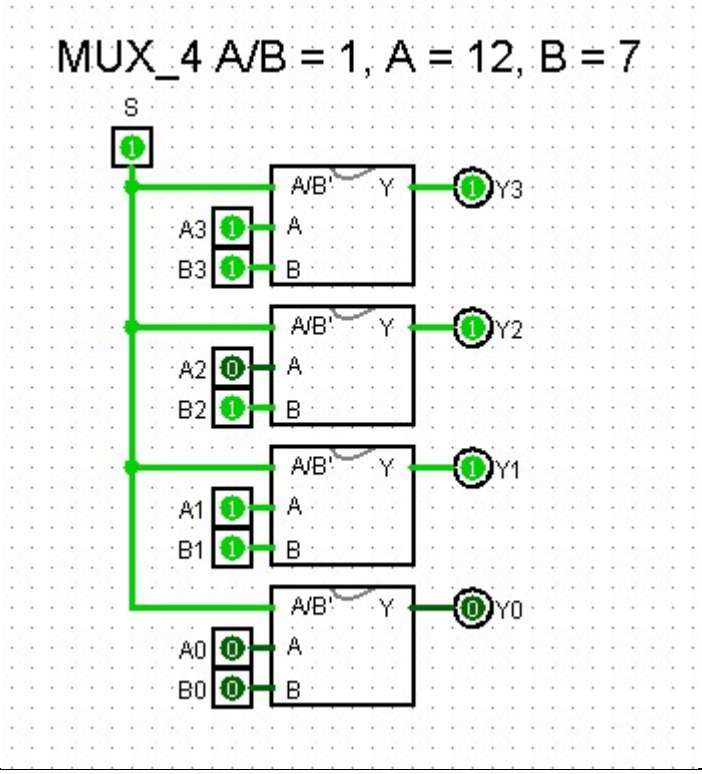
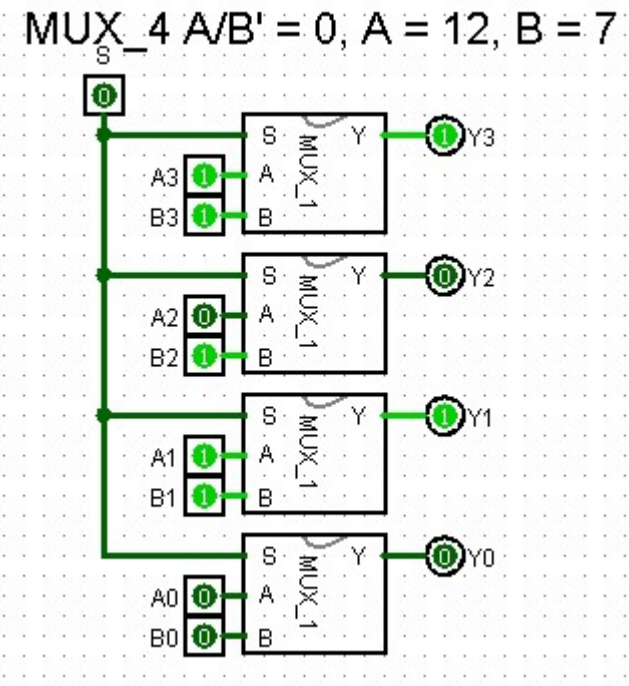
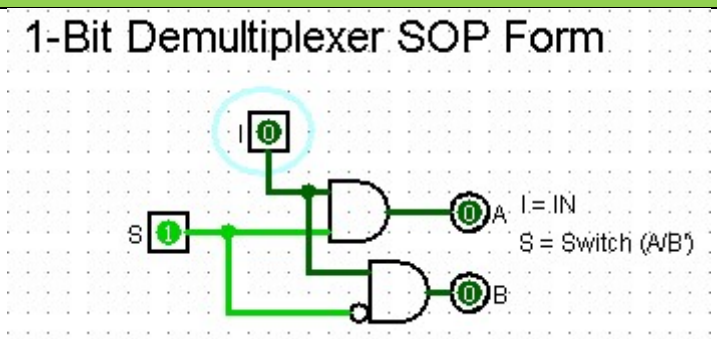
Overall Schematic	
SOP Equation	$Y_n = \bar{S}A_n + SB_n$ for n = 0,1,2,3

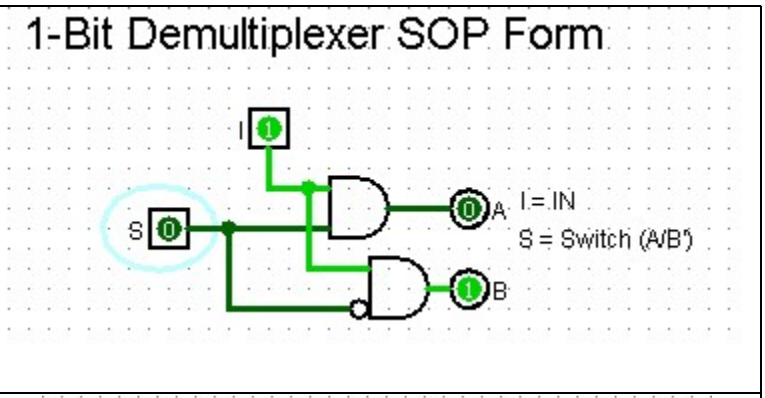
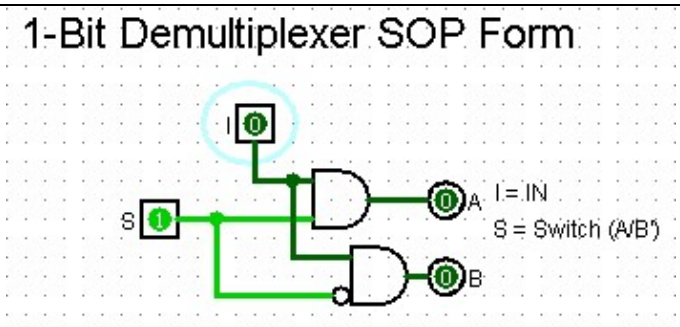
Truth Table for Suggested Case:
'A = 12, B = 7, A/B' = 1 and then with A/B' = 0'

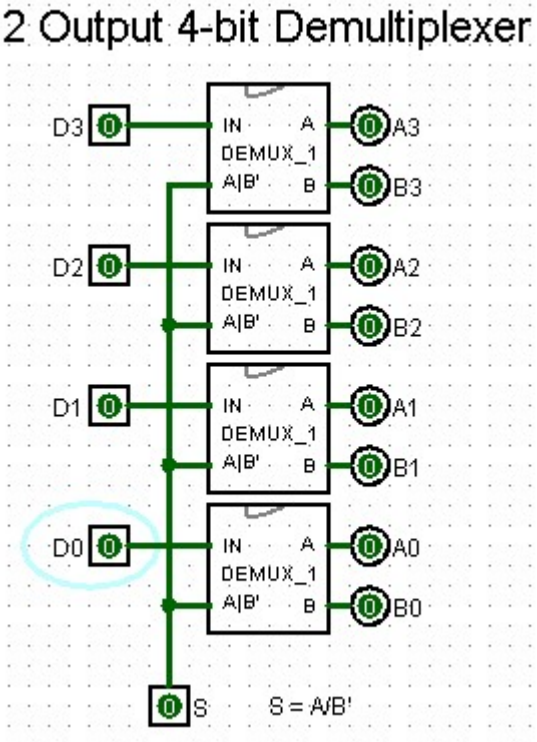
	S	A3	A2	A1	A0	B3	B2	B1	B0	Y3	Y2	Y1	Y0
A/B' = 1	1	1	0	1	0	0	1	1	1	0	1	1	1
A/B' = 0	0	1	0	0	1	1	0	0	1	1	0	0	1

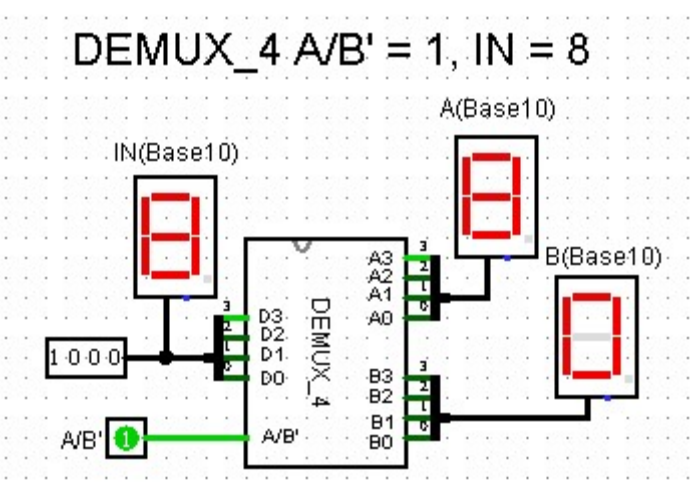
Suggested Case Results	A/B' = 1	
	A/B' = 0	

Task 3:

<table>
<tr><th colspan="3">[DEMUX_1.cct]</th></tr>
<tr><td>Schematic</td><td colspan="2"> 
</td></tr>
<tr><td>SOP Equation</td><td>$A = SI$</td><td>$B = \bar{S}I$</td></tr>
<tr><td>Truth Table</td><td colspan="2">
<table>
<tr><th>S</th><th>I</th><th>A</th><th>B</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>K-Map (A)</td><td colspan="2">
<table>
<tr><td></td><td></td><td>I</td><td></td></tr>
<tr><td></td><td></td><td>0</td><td>1</td></tr>
<tr><td>S</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td></td><td>1</td><td>0</td><td>1</td></tr>
<tr><td colspan="4">SI</td></tr>
</table>
</td></tr>
<tr><td>K-Map (B)</td><td colspan="2">
<table>
<tr><td></td><td></td><td>I</td><td></td></tr>
<tr><td></td><td></td><td>0</td><td>1</td></tr>
<tr><td>S</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td></td><td>1</td><td>0</td><td>0</td></tr>
<tr><td colspan="4">$\bar{S}$I</td></tr>
</table>
</td></tr>
</table>

Test Cases for Rows 2-3	 

[DEMUX_4.cct]		
Overall Schematic		
SOP Equation	$A_n = D_n S$ for n = 0,1,2,3	$B_n = D_n \bar{S}$ for n = 0,1,2,3

		S	D3	D2	D1	D0	A3	A2	A1	A0	B3	B2	B1	B0
Truth Table for Suggested Case: 'IN = 8, A/B' = 1 and then with A/B' = 0	A/B' = 1	1	1	0	0	0	1	0	0	0	0	0	0	0
	A/B' = 0	0	1	0	0	0	0	0	0	0	1	0	0	0
Suggested Case Results	A/B' = 1													
	A/B' = 0