

258 LAB2

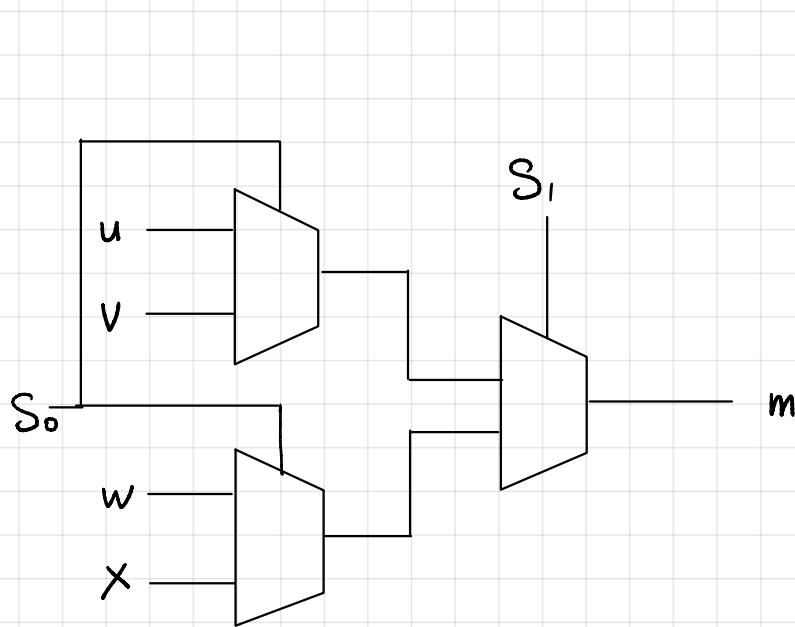
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Part 2

1. Answer the following question: if the truth table in Table 1 was given in full, how many rows would it have? (PRELAB)

$$2^6 = 64$$

2. Draw a schematic (not in Logisim) showing how you will connect the *mux2to1* modules to build the 4-to-1 multiplexer. Be prepared to explain it to the TA as part of your prelab. The schematic should reflect how you are going to create your Logisim circuit. (PRELAB)



S ₁ , S ₀	M
00	u
01	v
10	w
11	x

Part 3

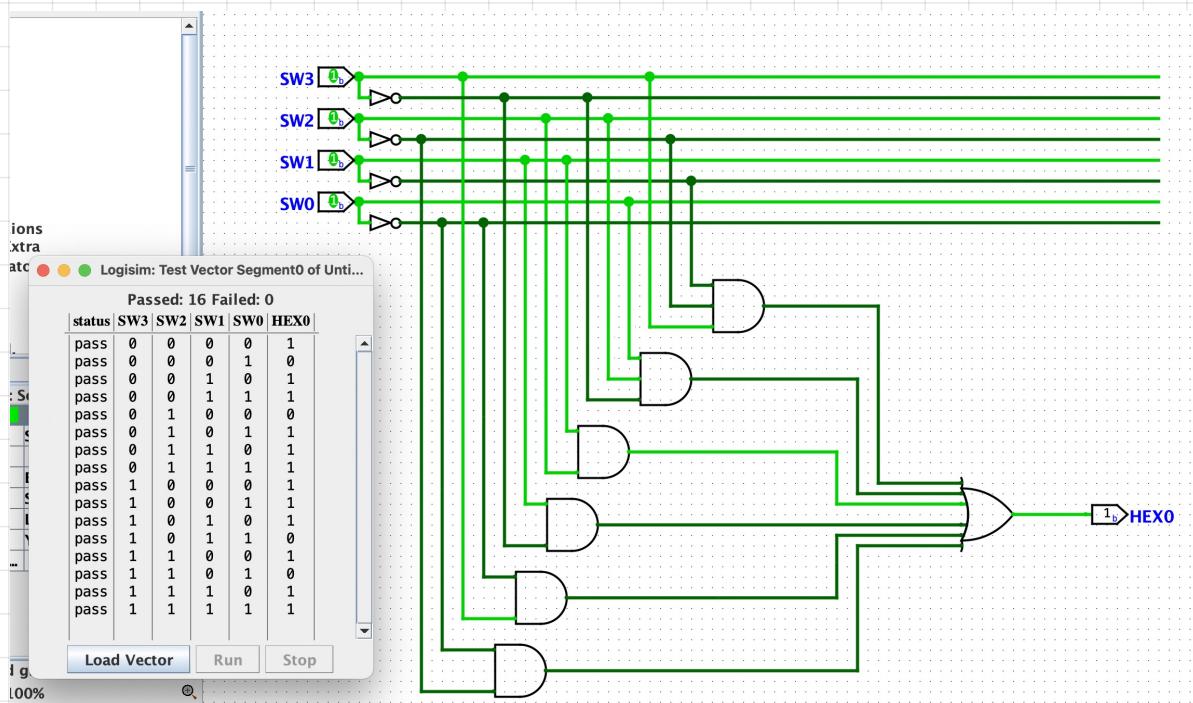
Segment 0

SW3	SW2	SW1	SW0	HEX0
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
b	1	0	1	1
C	1	1	0	0
d	1	1	0	1
E	1	1	1	0
F	1	1	1	1

Segment0

	00	01	11	10
	SW1'*SW0'	SW1'*SW0	SW1*SW0	SW1*SW0'
00	SW3'*SW2'	1	0	1
01	SW3'*SW2	0	1	1
11	SW3*SW2	1	0	1
10	SW3*SW2'	1	1	0

$$\begin{aligned}
 & SW2' * SW0' + SW3 * SW0' + \underline{SW3' * SW1} \\
 & + SW2 * SW1 + SW3' * SW2 * SW0 + SW3 * SW2' * SW1'
 \end{aligned}$$



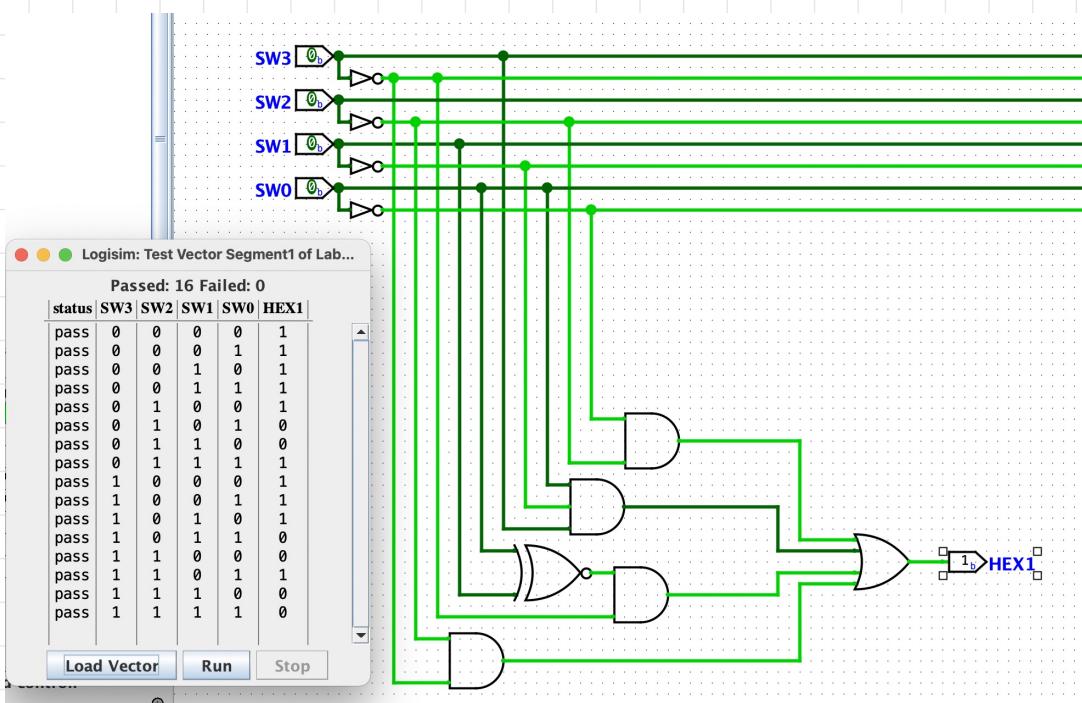
Segment 1 :

	SW3	SW2	SW1	SW0	HEX1
0	0	0	0	0	1
1	0	0	0	1	1
2	0	0	1	0	1
3	0	0	1	1	1
4	0	1	0	0	1
5	0	1	0	1	0
6	0	1	1	0	0
7	0	1	1	1	1
8	1	0	0	0	1
9	1	0	0	1	1
A	1	0	1	0	1
b	1	0	1	1	0
C	1	1	0	0	0
d	1	1	0	1	1
E	1	1	1	0	0
F	1	1	1	1	0

	00	01	11	10
	SW1'*SW0'	SW1'*SW0	SW1*SW0	SW1*SW0'
00	SW3'*SW2'	1	1	1
01	SW3'*SW2	1	0	1
11	SW3*SW2	0	1	0
10	SW3*SW2'	1	1	0

$$\begin{aligned}
 & SW3' * SW2' + [SW3' * SW1' * SW0' + SW3' * SW1 * SW0] \\
 & = SW3' * (SW1' * SW0' + SW1 * SW0) = SW3' * (SW1 \oplus SW0)
 \end{aligned}$$

$$+ SW3 * SW1' * SW0 + SW2' * SW0'$$

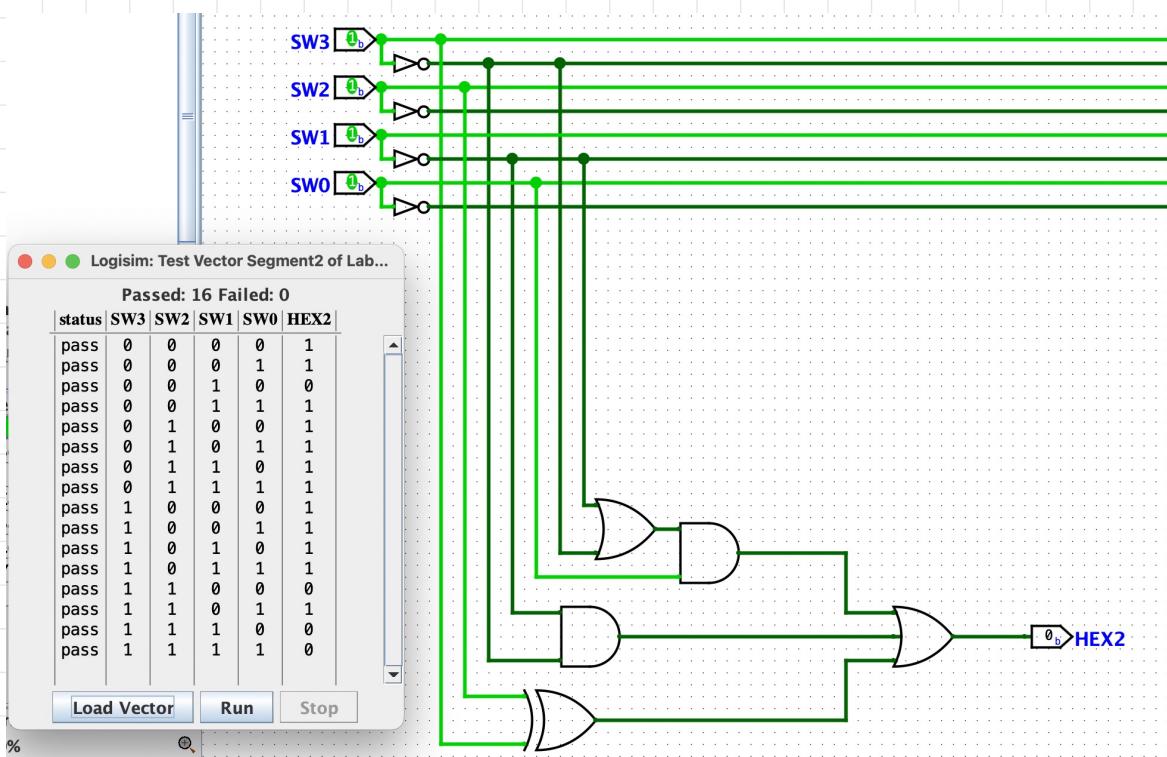


Segment 2:

Segment2	SW3	SW2	SW1	SW0	HEX2
0	0	0	0	0	1
1	0	0	0	1	1
2	0	0	1	0	0
3	0	0	1	1	1
4	0	1	0	0	1
5	0	1	0	1	1
6	0	1	1	0	1
7	0	1	1	1	1
8	1	0	0	0	1
9	1	0	0	1	1
A	1	0	1	0	1
b	1	0	1	1	1
C	1	1	0	0	0
d	1	1	0	1	1
E	1	1	1	0	0
F	1	1	1	1	0

	SW1'*SW0'	SW1'*SW0	SW1*SW0	SW1*SW0'
SW3'*SW2'	1	1	1	0
SW3'*SW2	1	1	1	1
SW3*SW2	0	1	0	0
SW3*SW2'	1	1	1	1

$$\begin{aligned}
 & SW3' * SW1' + SW3' * SW0 + SW1' * SW0 + \underline{SW3' * SW2 + SW3 * SW2'} \\
 = & SW3' * SW1' + (SW3' + SW1) * SW0 + SW3 * SW2
 \end{aligned}$$

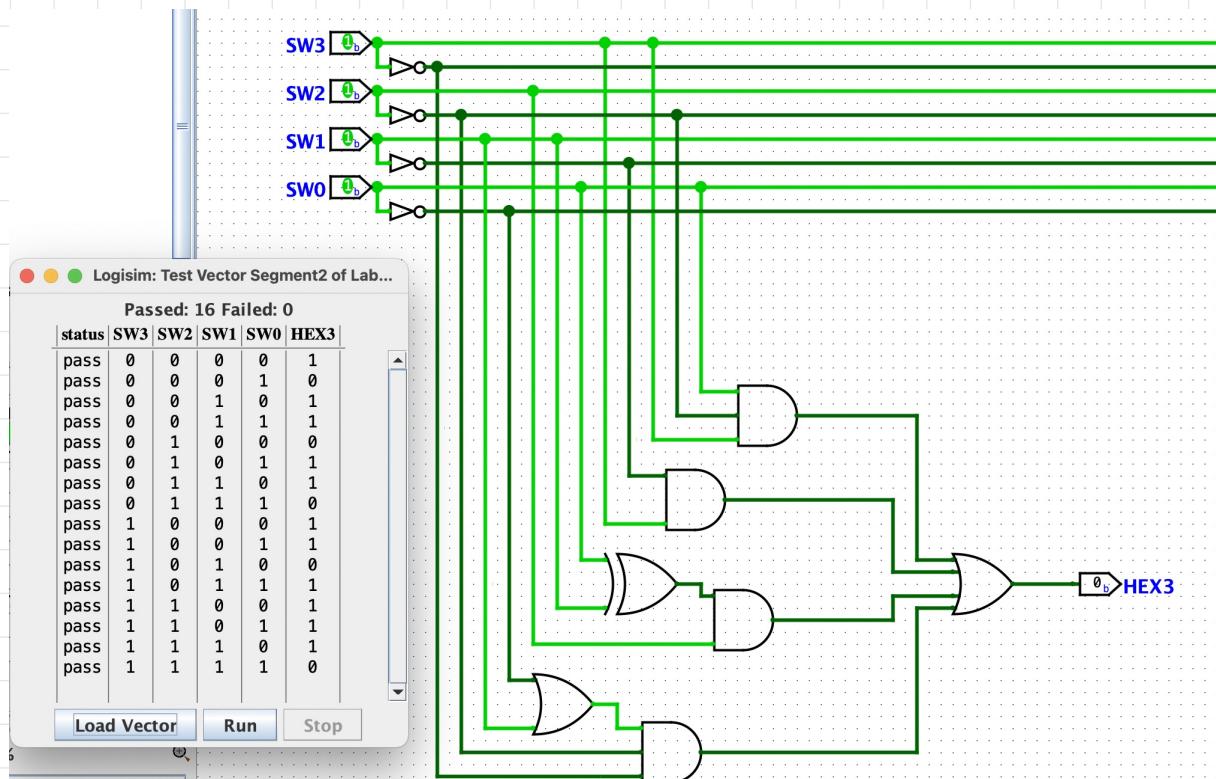


Segment 2:

Segment3	SW3	SW2	SW1	SW0	HEX3
0	0	0	0	0	1
1	0	0	0	1	0
2	0	0	1	0	1
3	0	0	1	1	1
4	0	1	0	0	0
5	0	1	0	1	1
6	0	1	1	0	1
7	0	1	1	1	0
8	1	0	0	0	1
9	1	0	0	1	1
A	1	0	1	0	0
b	1	0	1	1	1
C	1	1	0	0	1
d	1	1	0	1	1
E	1	1	1	0	1
F	1	1	1	1	0

	00	01	11	10
	SW1''*SW0'	SW1'*SW0	SW1*SW0	SW1'*SW0'
SW3'*SW2'	1	0	1	1
SW3'*SW2	0	1	0	1
SW2*SW2	1	1	0	1
SW3*SW2'	1	1	1	0

$$\begin{aligned}
 & SW3' * SW2' * SW0' + SW3' * SW2' * SW1 \\
 & + SW2 * SW1' * SW0 + SW2 * SW1 * SW0' \\
 & + SW3 * SW1' + SW3 * SW2' * SW0 \\
 = & SW3' * SW2' * (SW0' + SW1) + SW2 * (SW1 \oplus SW0) \\
 & + SW3 * SW1' + SW3 * SW2' * SW0
 \end{aligned}$$



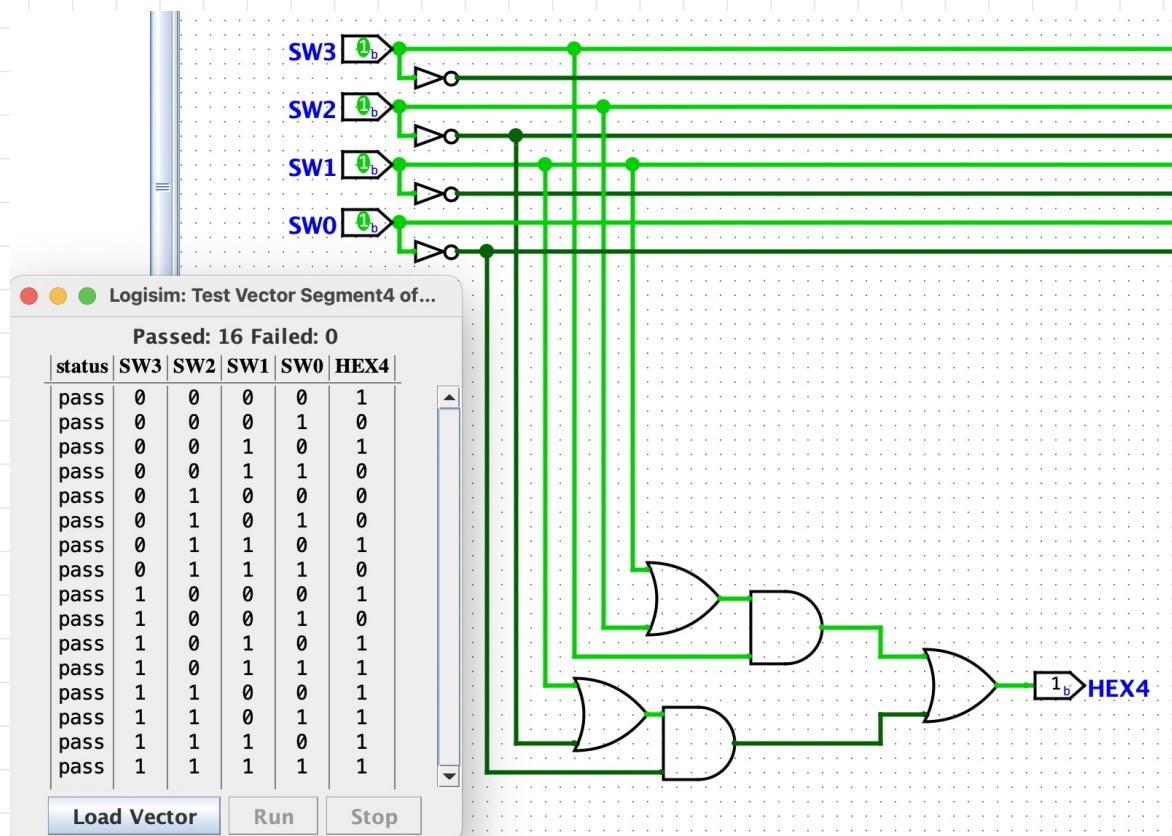
Segment 4

Segment4	SW3	SW2	SW1	SW0	HEX4
0	0	0	0	0	1
1	0	0	0	1	0
2	0	0	1	0	1
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	1
7	0	1	1	1	0
8	1	0	0	0	1
9	1	0	0	1	0
A	1	0	1	0	1
b	1	0	1	1	1
C	1	1	0	0	1
d	1	1	0	1	1
E	1	1	1	0	1
F	1	1	1	1	1

	SW1'*SW0'	SW1'*SW0	SW1*SW0	SW1*SW0'
1	SW3'*SW2'	1	0	0
1	SW3'*SW2	0	0	1
1	SW3*SW2	1	1	1
1	SW3*SW2'	1	0	1

$$SW2'*SW0' + SW3*SW2 + SW1*SW0' + SW3*SW1$$

$$= SW0' * (SW2' + SW1) + SW3 * (SW2 + SW1)$$

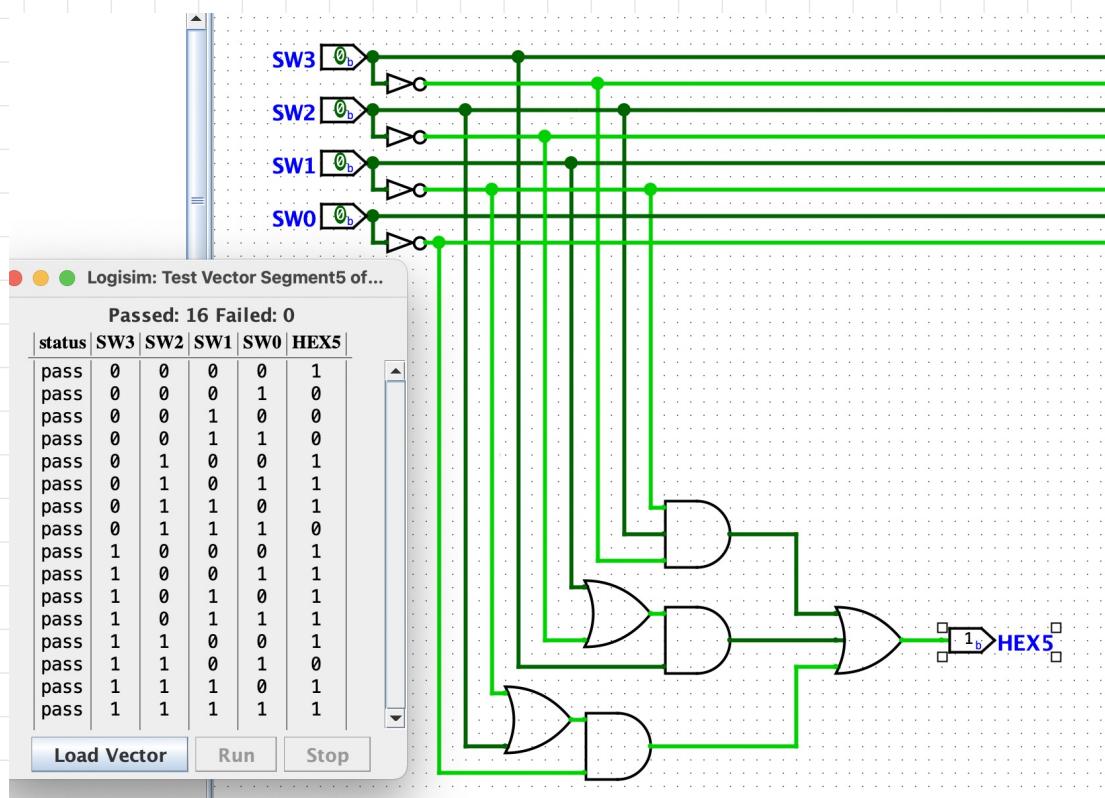


Segment 5

Segments	SW3	SW2	SW1	SW0	HEX5
0	0	0	0	0	1
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	1
5	0	1	0	1	1
6	0	1	1	0	1
7	0	1	1	1	0
8	1	0	0	0	1
9	1	0	0	1	1
A	1	0	1	0	1
b	1	0	1	1	1
C	1	1	0	0	1
d	1	1	0	1	0
E	1	1	1	0	1
F	1	1	1	1	1

	SW1'*SW0'	SW1'*SW0	SW1*SW0	SW1*SW0'
SW3'*SW2'	1	0	0	0
SW3'*SW2	1	1	0	1
SW3*SW2	1	0	1	1
SW3*SW2'	1	1	1	1

$$\begin{aligned}
 & SW1' * SW0' + SW1 * SW3 + SW3' * SW2 * SW1' + SW2 * SW0' + SW3 * SW2' \\
 & = SW0' * (SW1' + SW2) + SW3 * (SW1 + SW2') + SW3' * SW2 * SW1'
 \end{aligned}$$



Segment 6 :

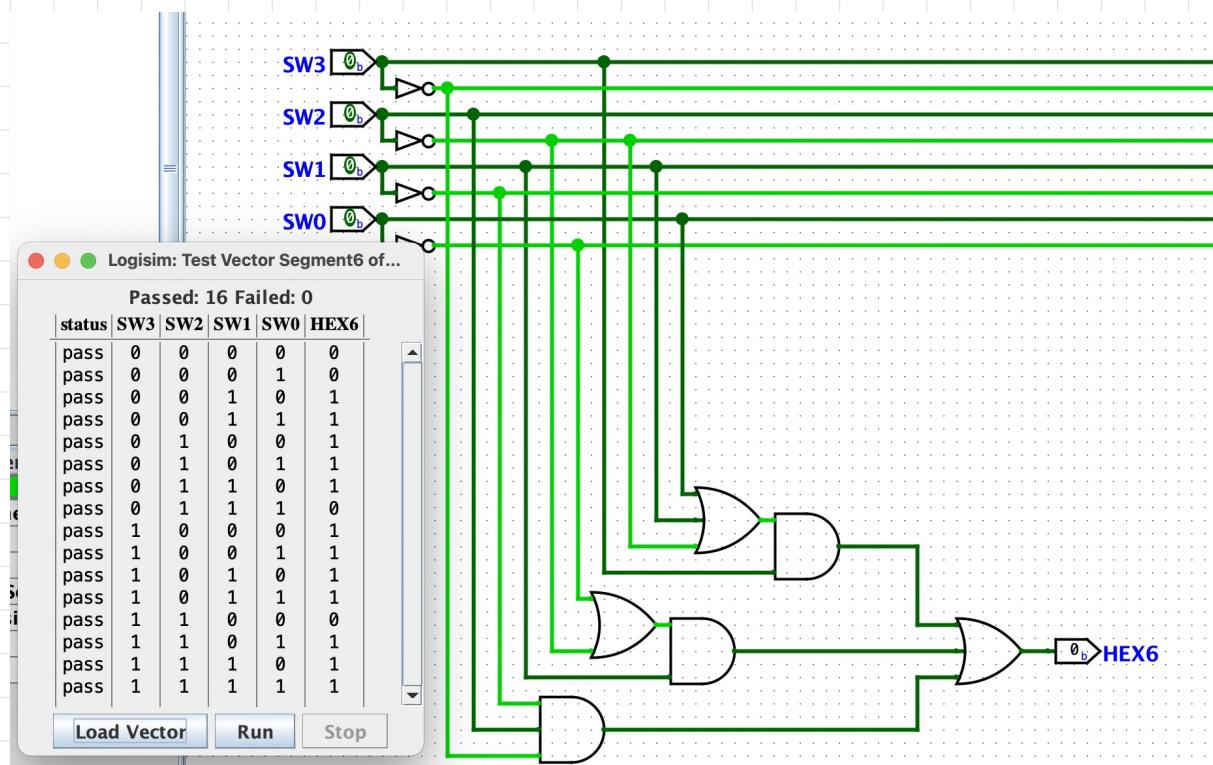
Segment6	SW3	SW2	SW1	SW0	HEX6
0	0	0	0	0	0
1	0	0	0	1	0
2	0	0	1	0	1
3	0	0	1	1	1
4	0	1	0	0	1
5	0	1	0	1	1
6	0	1	1	0	1
7	0	1	1	1	0
8	1	0	0	0	1
9	1	0	0	1	1
A	1	0	1	0	1
b	1	0	1	1	1
C	1	1	0	0	0
d	1	1	0	1	1
E	1	1	1	0	1
F	1	1	1	1	1

	SW1'*SW0'	SW1'*SW0	SW1*SW0	SW1*SW0'
1	0	0	1	1
1	1	1	0	1
1	0	1	1	1
1	1	1	1	1

$$SW3' * SW2 * SW1' + SW1 * SW2' + SW1 * SW0' + SW3 * SW0 + SW3 * SW1$$

$$+ SW3 * SW2'$$

$$= SW3' * SW2 * SW1' + SW1 * (SW2' + SW0') + SW3 * (SW0 + SW1 + SW2')$$



Main

