EECE 144
Fall 2011

Lab Report #5
Section 4
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Submitted by:

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1 Description/Objectives

The objective of this lab is to derive a simplified form of a canonical SOP equation using a Karnaugh Map and to implement it in hardware.

2 Procedure

The canonical SOP form of the equation used in this lab is given in Equation 1.

$$\begin{aligned} f(a,b,c) &= \sum m(0,2,3,4,6) \\ &= m_0 + m_2 + m_3 + m_4 + m_6 \\ &= a'b'c' + a'bc' + a'bc + ab'c' + abc' \end{aligned} \tag{1}$$

The truth table produced from Equation 1 is shown in Figure 1. And the Karnaugh Map produced from the truth table is shown in Figure 2. Using the groupings produced by the Karnaugh Map results in the simplifed Equation 2. Finally the circuit definition is show in Figure 3.

$$f(a, b, c) = c' + a'b \tag{2}$$

Index	a	b	c	f
0	0	0	0	1
1	0	0	1	0
2	0	1	0	1
3	0	1	1	1
4	1	0	0	1
5	1	0	1	0
6	1	1	0	1
7	1	1	1	0

Figure 1: Truth table of Equation 1.

a	b	c	
		0	1
0	0	1	0
0	1	1	1
1	1	1	0
1	0	1	0

Figure 2: Karnaugh Map of Equation 1. The largest 4 element grouping is shown in red and the smaller two element grouping is shown in blue.

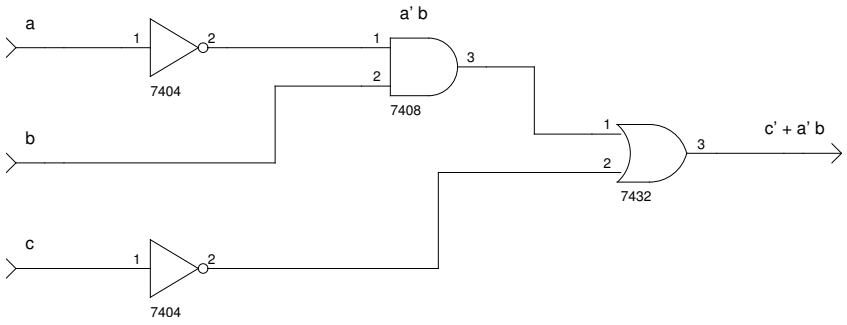

Figure 3: Circuit definition of equation 2.

3 Observations

4 Conclusion