CS470 Spring 2008

Homework Assignment 1
Due Feb. 12, 2008

Problem 1:

a. The truth table for a combinational circuit is given below with the inputs A, B and C and the outputs X, Y and Z. Obtain minimized expressions for X, Y and Z in sum-of products form.

A	B	C	X	Y	Z
0	0	0	1	1	1
0	0	1	1	0	0
0	1	0	0	x	0
0	1	1	1	0	1
1	0	0	0	1	0
1	0	1	0	1	0
1	1	0	1	1	1
1	1	1	1	0	1

A\ B C	00	01	11	10
0				
1				

X=

A\ B C	00	01	11	10
0				
1				

Y =

A\ B C	00	01	11	10
0				
1				

Z =

c. Give a logic diagram for both using AND gates, OR gates and inverters. Verify the design using Logisim (see lab assignment)

d. Implement the above function as a PLA. Minimize the number of product terms. Show the table as well as the PLA diagram.

Problem 2: Obtain minimized SOP expressions.

AB\CD	00	01	11	10
00				
01	1			1
11	1	1	1	1
10		1		

AB\CD	00	01	11	10
00	x			1
01		1	1	
11			1	
10	1			1

a\bc	00	01	11	10
0	1	x		1
1	1	1		

Problem 3: Answer questions B.7 and B.9 form the text (Appendix B on CD). Minimize the PLA. (Use extra paper as needed).