

SIMPLE EXAMPLES

1. Implement the following function using PLA

$$w(A, B, C, D) = \sum(2, 12, 13)$$

$$x(A, B, C, D) = \sum(7, 8, 9, 10, 11, 12, 13, 14, 15)$$

$$y(A, B, C, D) = \sum(0, 2, 3, 4, 5, 6, 7, 8, 10, 11, 15)$$

$$z(A, B, C, D) = \sum(1, 2, 8, 12, 13)$$

The simplified Boolean functions are:

$$w = ABC' + A'B'CD'$$

$$x = A + BCD$$

$$y = A'B + CD + B'D'$$

$$z = ABC' + A'B'CD' + AC'D' + A'B'C'D$$

$$= w + AC'D' + A'B'C'D$$

The resulting PLA programming table is:

Product Term	AND Inputs				W	Outputs
	A	B	C	D		
1	1	1	0	–	–	$w = ABC' + A'B'CD'$
2	0	0	1	0	–	
3	–	–	–	–	–	
4	1	–	–	–	–	$x = A + BCD$
5	–	1	1	1	–	
6	–	–	–	–	–	
7	0	1	–	–	–	$y = A'B + CD + B'D'$
8	–	–	1	1	–	
9	–	0	–	0	–	
10	–	–	–	–	1	$z = w + AC'D' + A'B'C'D$
11	1	–	0	0	–	
12	0	0	0	1	–	

The logic diagram of the programmed PAL is:

