CSE-231

Lab Assignment-1

Team-47

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Section: 4

CSE 231

Table 1: Truth table to a combinational circuit

	S_1	S_2	C_1	C_2	F	Min term	Max term
0	0	0	0	0	0		$S_1+S_2+C_1+C_2$
1	0	0	0	1	0		$S_1+S_2+C_1+C_2'$
2	0	0	1	0	0		$S_1+S_2+C_1'+C_2$
3	0	0	1	1	0		$S_1+S_2+C_1'+C_2'$
4	0	1	0	0	1	$S_1'S_2C_1'C_2'$	
5	0	1	0	1	0		$S_1+S_2'+C_1+C_2'$
6	0	1	1	0	0		$S_1+S_2'+C_1'+C_2$
7	0	1	1	1	0		$S_1+S_2'+C_1'+C_2'$
8	1	0	0	0	1	$S_1S_2'C_1'C_2'$	
9	1	0	0	1	0		$S_1'+S_2+C_1+C_2'$
10	1	0	1	0	0		$S_1'+S_2+C_1'+C_2$
11	1	0	1	1	0		$S_1'+S_2+C_1'+C_2'$
12	1	1	0	0	1	$S_1S_2C_1'C_2'$	
13	1	1	0	1	1	$S_1S_2C_1'C_2$	
14	1	1	1	0	1	$S_1S_2C_1C_2'$	
15	1	1	1	1	0		$S_1'+S_2'+C_1'+C_2'$

Table: 2: 1st and 2nd canonical forms of the combinational circuit of table 1

	Shorthand Notation	Function
1st Canonical Form	$F=\Sigma(4,8,12,13,14)$	$F = S_1' S_2 C_1' C_2' + S_1 S_2' C_1' C_2' + S_1 S_2 C_1' C_2' + S_1 S_2 C_1' C_2 + S_1 S_2 C_1 C_2'$
2nd Canonical Form	$F=\Pi(0,1,2,3,5,6,7,9,10,11,15)$	$F = (S_1+S_2+C_1+C_2)(S_1+S_2+C_1+C_2')(S_1+S_2+C_1'+C_2)(S_1+S_2+C_1'+C_2')(S_1+S_2'+C_1+C_2')(S_1+S_2'+C_1'+C_2)(S_1+S_2'+C_1'+C_2')(S_1'+S_2+C_1+C_2')(S_1'+S_2+C_1'+C_2)(S_1'+S_2+C_1'+C_2')(S_1'+S_2'+C_1'+C_2')$