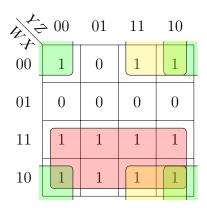
Assignment 1

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Problem 1 : Design Combinational Circuit

1. $F(W, X, Y, Z) = \sum m(0, 2, 3, 8, 9, 10, 11, 12, 13, 14, 15)$

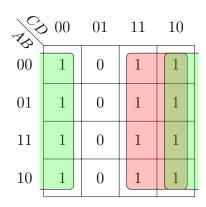


$$\Rightarrow F = W + X'Z' + X'Y$$

2. $F(W, X, Y, Z) = \sum m(3, 9, 11, 12, 13, 14, 15) + \sum d(1, 4, 6)$

$$\Rightarrow F = WX + X'Z$$

3.
$$F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'$$



$$\Rightarrow F = C + D'$$

Truth table

A	B	C	D	$\mid F$
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	
0	1	0	1	$\begin{vmatrix} 1 \\ 0 \end{vmatrix}$
0	1	1	0	1
0	1	1	1	1 1 1 0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	
1	1	0	1	$\begin{vmatrix} 1 \\ 0 \end{vmatrix}$
1	1	1	0	1
1	1	1	1	1

4. F(A, B, C, D) = A'B'C'D + CD + AC'D

00 00	00	01	11	10
00	0	1	1	0
01	0	0	1	0
11	0	1	1	0
10	0	1	1	0

 $\Rightarrow F = AD + B'D + CD$

Truth table

A	В	C	D	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	$\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$
1	0	0	0	0
1	0	0	1	1
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

Problem 2 : Design Sequential Circuit

Current State (S)	Next State (S')		Output (7)
Current State (S)	X=0	X=1	Output (Z)
A	F	В	0
В	A	F	1
С	A	D	1
D	F	E	0
E	D	В	1
F	D	Е	0