Assignment 1 — FPGA Lab

Sankala Sreekanth

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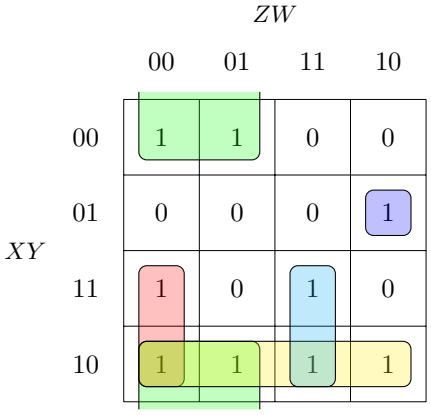
1 Question

Reduce the following Boolean expression to its simplest form using K-Map

$$F(X,Y,Z,W) = \sum(0,1,6,8,9,10,11,12,15) \tag{1}$$

2 Solution

Represent the given Boolean expression in K-Map and follow the K-Map rules to reduce the given Boolean form to simplest form



$$F(X,Y,Z,W) = \overline{YZ} + X\overline{Y} + X\overline{ZW} + XZW + \overline{X}Y\overline{ZW} \tag{2}$$

X	Y	Z	W	F(X,Y,Z,W)
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

Table 1: Truth Table