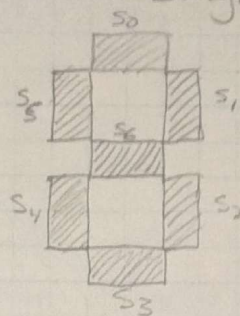


Truth table

$b_3 b_2 b_1 b_0$	Value	S_0	S_1	S_2	S_3	S_4	S_5	S_6
0 0 0 0	0	1	1	1	1	1	1	0
0 0 0 1	1	0	1	1	0	0	0	0
0 0 1 0	2	1	1	0	1	1	0	1
0 0 1 1	3	1	1	1	1	0	0	1
0 1 0 0	4	0	1	1	0	0	1	1
0 1 0 1	5	1	0	1	1	0	1	1
0 1 1 0	6	1	0	1	1	1	1	1
0 1 1 1	7	1	1	1	0	0	0	0
1 0 0 0	8	1	1	1	1	1	1	1
1 0 0 1	9	1	1	1	1	0	1	1
1 0 1 0	A	1	1	1	0	1	1	1
1 0 1 1	B	0	0	1	1	1	1	1
1 1 0 0	C	1	0	0	1	1	1	0
1 1 0 1	D	0	1	1	1	1	0	1
1 1 1 0	E	1	0	0	1	1	1	1
1 1 1 1	F	1	0	0	0	1	1	1

Screen Diagram



Karnaugh Maps And Equations

S_0
 $b_3 b_2$ $b_1 b_0$

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

$$S_0 = b_1 \bar{b}_0 + b_1 \bar{b}_3 + b_1 b_2 + \bar{b}_0 b_2 + b_3 \bar{b}_1 \bar{b}_0 + b_3 \bar{b}_2 b_1 + \bar{b}_3 b_2 b_0$$

S_1
 $b_3 b_2$ $b_1 b_0$

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

$$S_1 = \bar{b}_2 b_0 + \bar{b}_3 b_1 b_0 + \bar{b}_3 b_2 + b_3 b_0 \bar{b}_1 + \bar{b}_3 b_1 b_0$$

S_2
 $b_3 b_2$ $b_1 b_0$

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

$$S_2 = b_3 \bar{b}_2 + \bar{b}_3 b_2 + \bar{b}_1 b_0 + \bar{b}_3 \bar{b}_1 + \bar{b}_3 b_0$$

S_3
 $b_3 b_2$ $b_1 b_0$

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

$$S_3 = b_3 \bar{b}_1 + b_2 \bar{b}_1 b_0 + b_3 \bar{b}_2 b_1 + b_2 b_1 \bar{b}_0 + \bar{b}_3 b_2 b_1 + \bar{b}_3 b_2 b_0$$

S_4	$b_1 b_0$
$b_3 b_2$	00 01 11 10
00	0 0 0 1
01	0 0 0 1
11	1 1 1 1
10	1 0 1 1

$$S_4 = \overline{b_2} \overline{b_0} + b_3 b_2 + b_1 \overline{b_0} + b_3 b_1 b_0$$

S_5	$b_1 b_0$
$b_3 b_2$	00 01 11 10
00	1 0 0 0
01	1 1 0 1
11	1 0 1 0
10	1 1 1 1

$$S_5 = \overline{b_1} \overline{b_0} + b_3 \overline{b_2} + b_3 b_1 + \overline{b_3} b_2 \overline{b_1} + b_2 b_1 \overline{b_0}$$

S_6	$b_1 b_0$
$b_3 b_2$	00 01 11 10
00	0 0 1 1
01	1 1 0 1
11	0 1 1 1
10	1 1 1 1

$$S_6 = b_1 \overline{b_0} + b_3 \overline{b_2} + b_3 b_0 + \overline{b_3} b_2 \overline{b_1} + \overline{b_3} b_2 b_1$$