

Forme normale minimale: exemplu

Se consideră tabelul de adevăr al formulei și se consideră implicații primi, cărora li se aplică procedura de reducere:

Truth table:

	x_3	x_2	x_1	x_0	y
0:	0	0	0	0	0
1:	0	0	0	1	1
2:	0	0	1	0	1
3:	0	0	1	1	1
4:	0	1	0	0	1
5:	0	1	0	1	1
6:	0	1	1	0	1
7:	0	1	1	1	1
8:	1	0	0	0	1
9:	1	0	0	1	1
10:	1	0	1	0	0
11:	1	0	1	1	0
12:	1	1	0	0	1
13:	1	1	0	1	1
14:	1	1	1	0	1
15:	1	1	1	1	1

Implicants (Order 0):

	x_3	x_2	x_1	x_0
1:	0	0	0	1
2:	0	0	1	0
3:	0	0	1	1
4:	0	1	0	0
5:	0	1	0	1
6:	0	1	1	0
7:	0	1	1	1
8:	1	0	0	0
9:	1	0	0	1
12:	1	1	0	0
13:	1	1	0	1
14:	1	1	1	0
15:	1	1	1	1

Implicants (Order 1):

	x_3	x_2	x_1	x_0
1, 3:	0	0	-	1
1, 5:	0	-	0	1
1, 9:	-	0	0	1
2, 3:	0	0	1	-
2, 6:	0	-	1	0
3, 7:	0	-	1	1
4, 5:	0	1	0	-
4, 6:	0	1	-	0
4, 12:	-	1	0	0
5, 7:	0	1	-	1
5, 13:	-	1	0	1
6, 7:	0	1	1	-
6, 14:	-	1	1	0
7, 15:	-	1	1	1
8, 9:	1	0	0	-
8, 12:	1	-	0	0
9, 13:	1	-	0	1
12, 13:	1	1	0	-
12, 14:	1	1	-	0
13, 15:	1	1	-	1
14, 15:	1	1	1	-

Implicants (Order 2):

	x_3	x_2	x_1	x_0
1, 3, 5, 7:	0	-	-	1
1, 5, 9, 13:	-	-	0	1
2, 3, 6, 7:	0	-	1	-
4, 5, 6, 7:	0	1	-	-
4, 5, 12, 13:	-	1	0	-
4, 6, 12, 14:	-	1	-	0
5, 7, 13, 15:	-	1	-	1
6, 7, 14, 15:	-	1	1	-
8, 9, 12, 13:	1	-	0	-
12, 13, 14, 15:	1	1	-	-

Apoi urmează până nu se mai pot reduce:

Implicants (Order 3):

	x_3	x_2	x_1	x_0
4, 5, 6, 7, 12, 13, 14, 15:	-	1	-	-

Prime implicant chart:

	x_3	x_2	x_1	x_0	1	2	3	4	5	6	7	8	9	12	13	14	15
4, 5, 6, 7, 12, 13, 14, 15:	-	1	-	-				●	○	○	○				○	○	●
1, 3, 5, 7:	0	-	-	1	○		○		○		○						
1, 5, 9, 13:	-	-	0	1	○				○				○		○		
2, 3, 6, 7:	0	-	1	-		●	○			○	○						
8, 9, 12, 13:	1	-	0	-								●	○	○	○		

Extracted essential prime implicants: $(\bar{x}_3\bar{x}_1)$, (x_2) , $(x_3\bar{x}_1)$

Reduced prime implicant chart (Iteration 0):

	x_3	x_2	x_1	x_0	1
1, 3, 5, 7:	0	-	-	1	●

După care extragem o submulțime minimală:

Extracted essential prime implicants: (\bar{x}_3x_1) , (x_2) , $(x_3\bar{x}_1)$

Reduced prime implicant chart (Iteration 0):

	x_3	x_2	x_1	x_0	1
1, 3, 5, 7:	0	-	-	1	● (\bar{x}_3x_0)

Extracted essential prime implicants: (\bar{x}_3x_0)

Minimal boolean expression:

$$y = (\bar{x}_3x_1) \vee (x_2) \vee (x_3\bar{x}_1) \vee (\bar{x}_3x_0)$$

Legend:

Don't-care: \times

Implicant (non prime): \rightarrow

Prime implicant: \checkmark

Essential prime implicant: ●

Prime implicant but covers only don't-care: (\times)