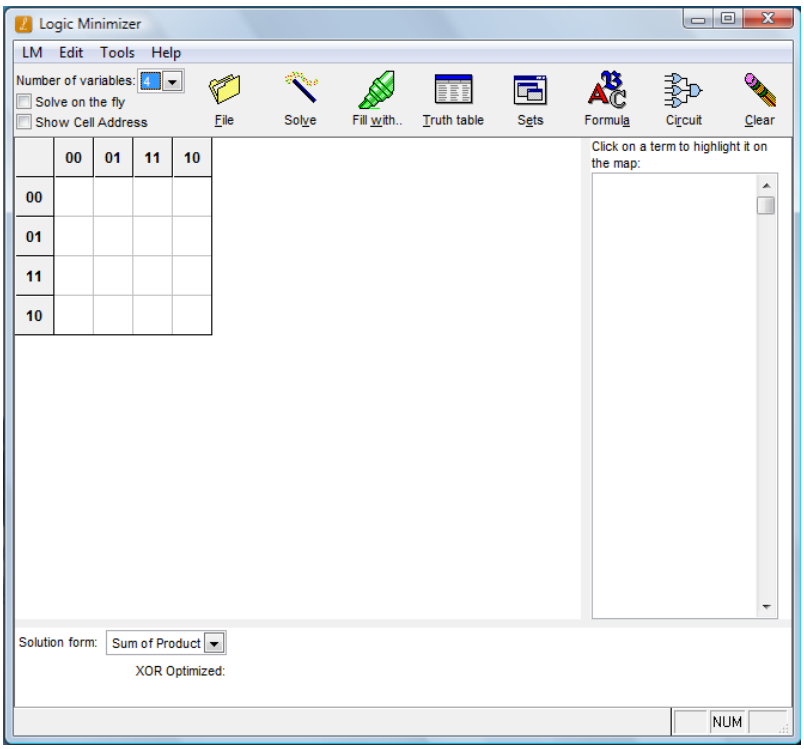
How to Use Logic Minimizer

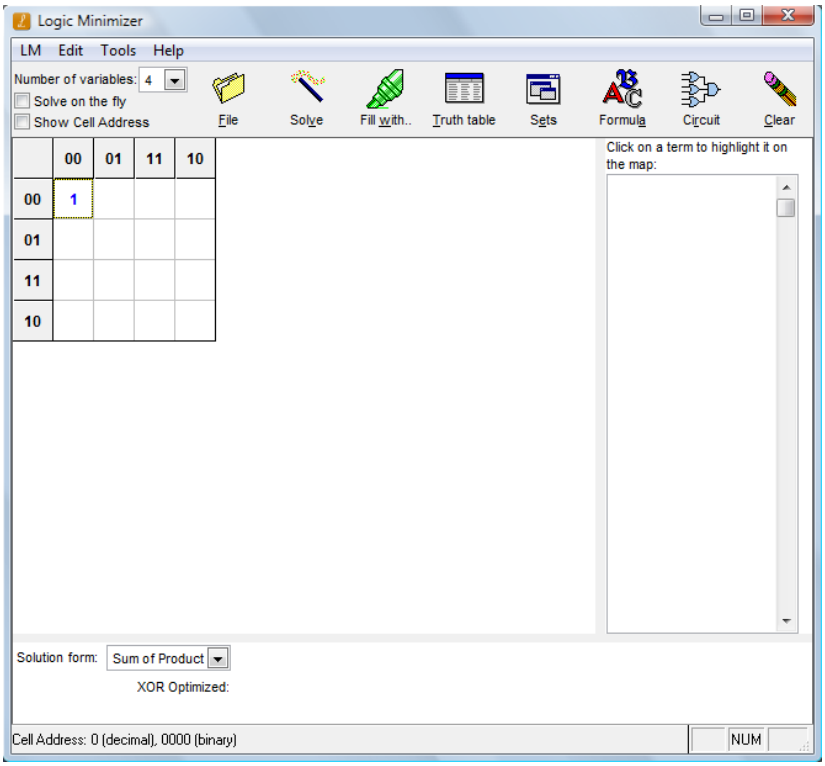
Use the Karnaugh Map to minimize the following standard SOP expression.

$$\overline{A}\overline{B}\overline{C}D + \overline{A}\overline{B}C\overline{D} + \overline{A}BC\overline{D} + \overline{A}BCD + A\overline{B}\overline{C}\overline{D} + A\overline{B}CD + AB\overline{C}\overline{D} + AB\overline{C}D + ABC\overline{D}$$

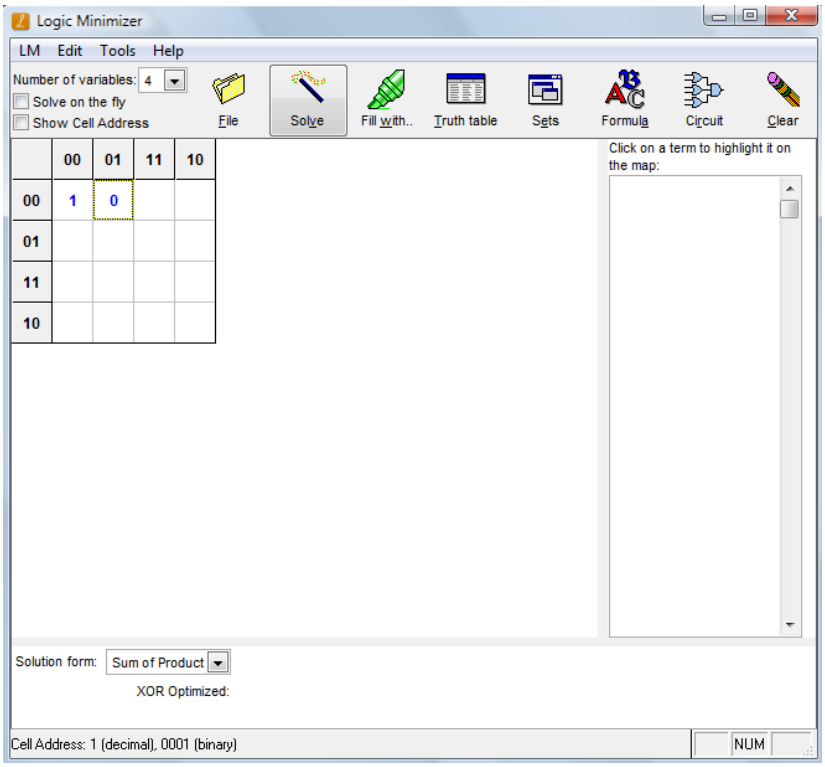
1. Open Logic Minimizer and the screen will become like this.



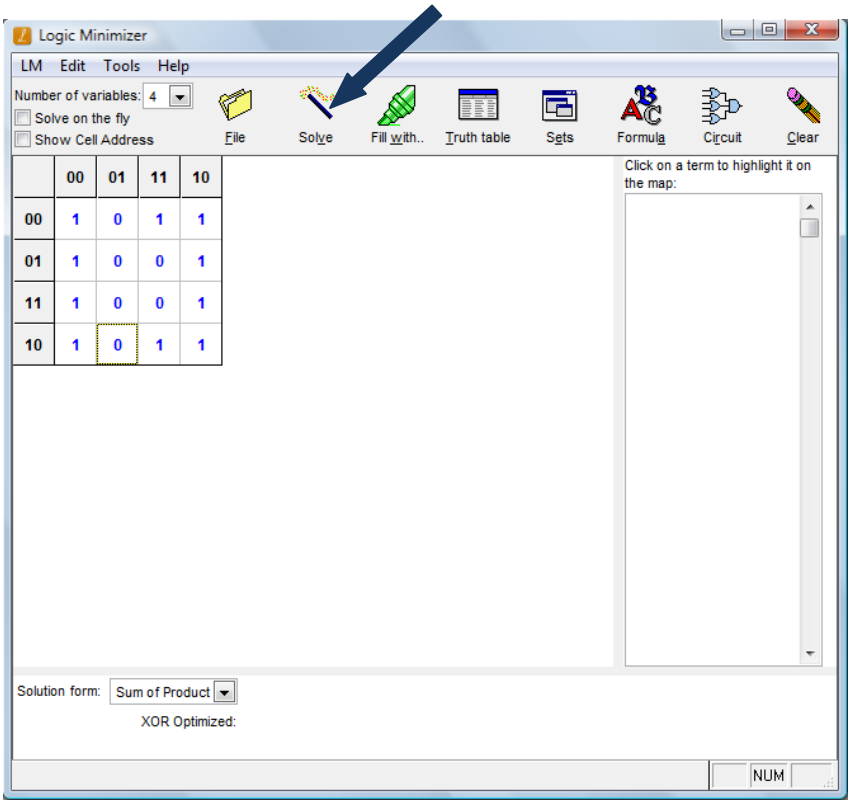
2. Fill the box with the value based on the standard SOP expression. Double click at the box to get the value “1”. To get “0” on the box, double click the box twice.



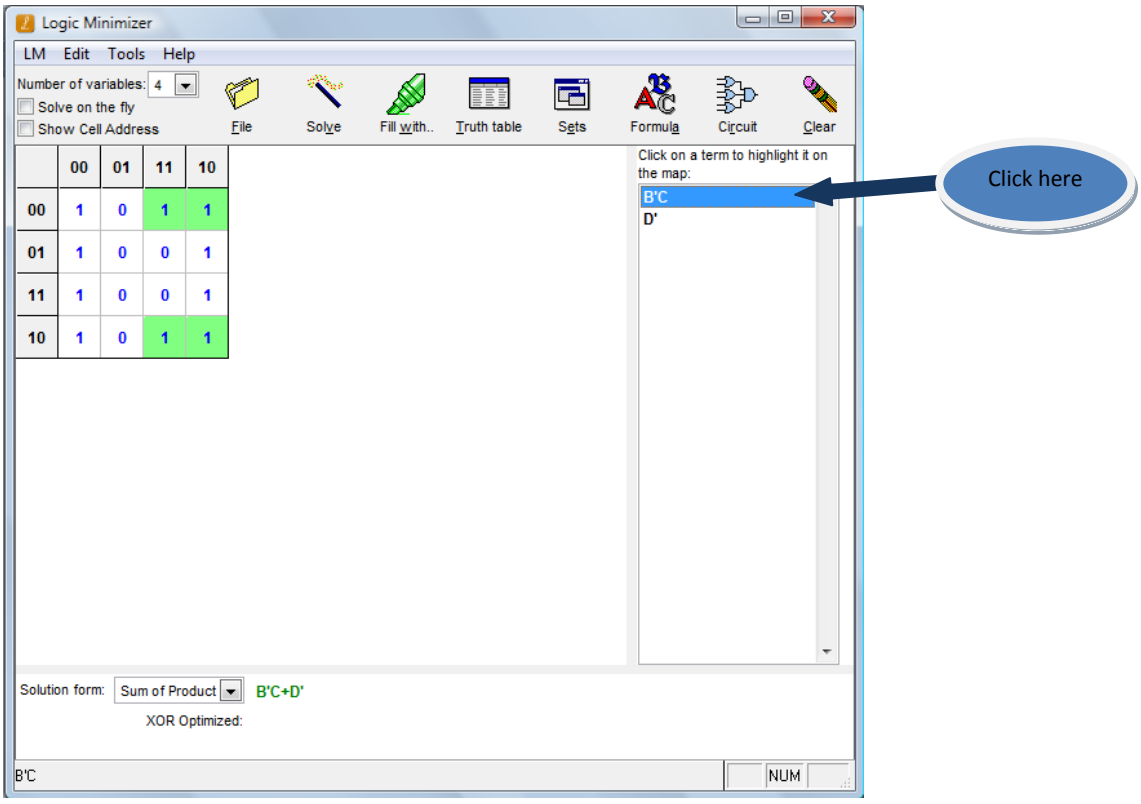
3. To get “0” on the box, double click the box twice.



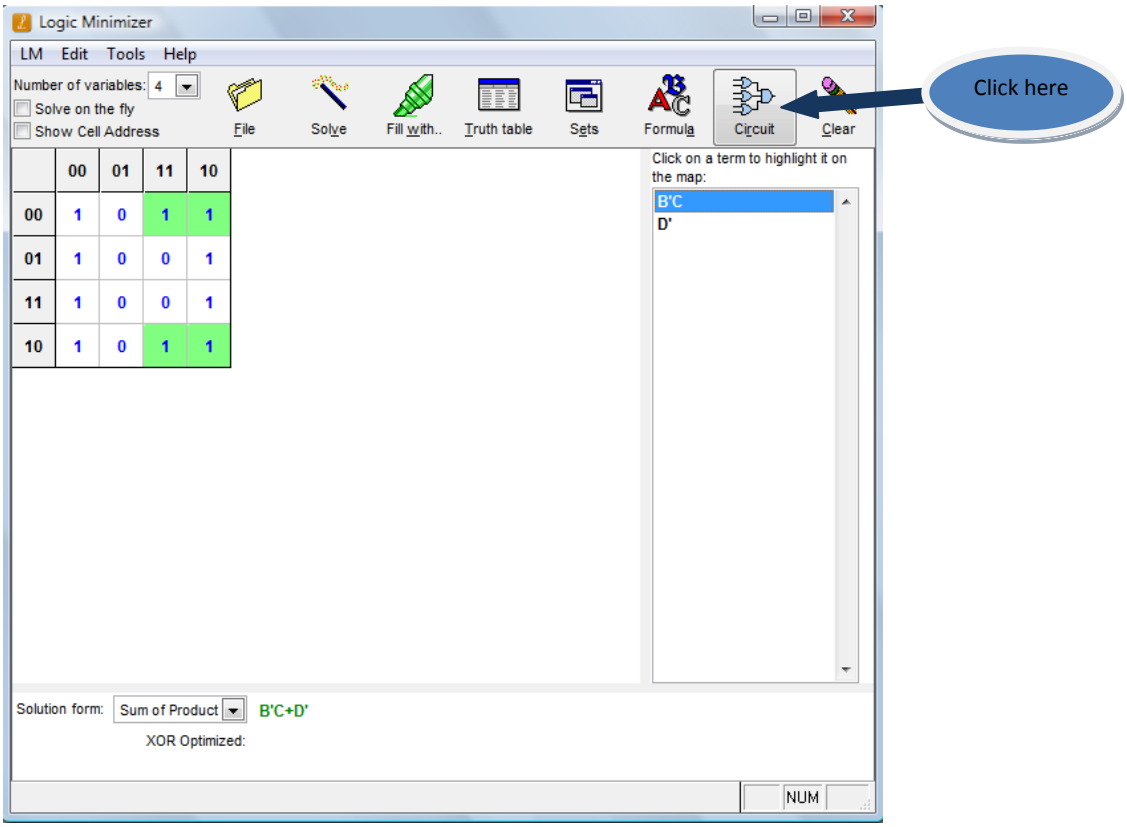
Fill all the box with value “0” or “1” based on the expression. Once finish, click “Solve” to get the simplified SOP expression.



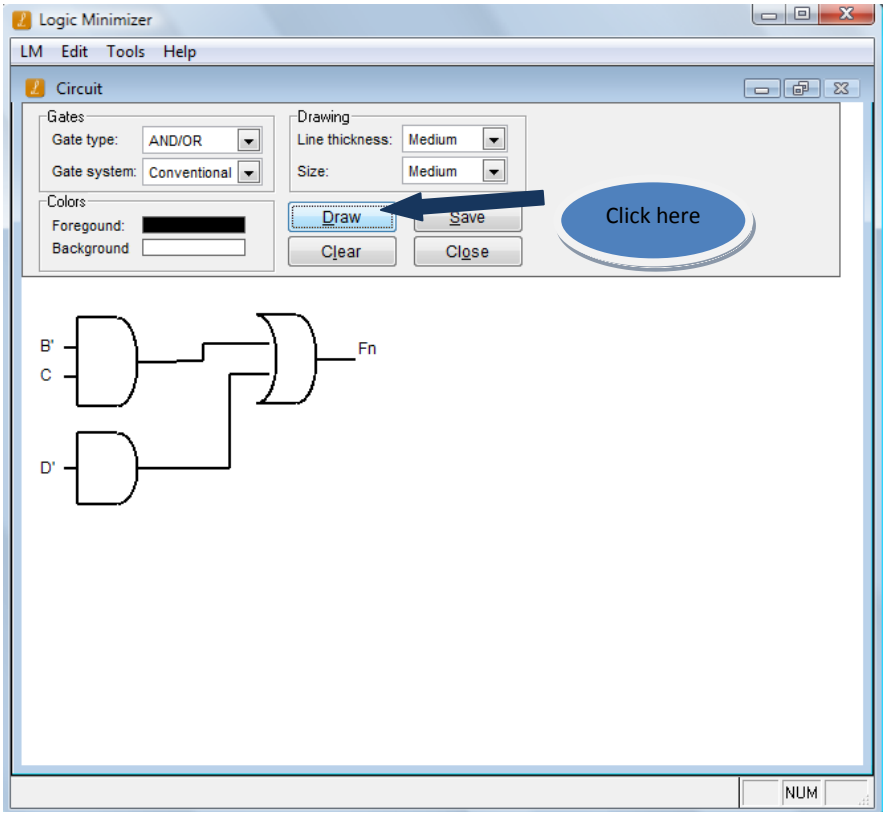
Click the expression at the right of the window to view the simplified box.



Click ‘Circuit” to view the circuit menu.



Click “Draw” to view the circuit. The circuit is in the simplified version.



Exercise

Note: Show the calculation to get the equation into the canonical form. Print screens the Karnaugh map table and the logic circuit after simplification.

1. Simplified the equation using Karnaugh Map F = A' + AB' + ABC'
2. Simplified the equation using Karnaugh Map F = A'B(C'D'+ C'D) + AB(C'D'+C'D) + AB'C'D
3. Based on the truth table below, derive the SOP expression and simplified the equation by using the Karnaugh Map.

A	B	C	D	Y
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
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	1
1	1	1	1	1

4. Based on the truth table before, derive the POS expression and simplified the equation by using the Karnaugh Map.
5. Simplified the equation using Karnaugh Map F= A(B' +C)