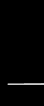


Switching Circuit & Logic Design

Lecture 9 : Karnaugh Map



Min terms

A	B	f
0	0	1
0	1	0
1	0	1
1	1	1



Min terms

Minterm	A	B	f
0	0	0	1
1	0	1	0
2	1	0	1
3	1	1	1

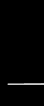


Min terms

Minterm	A	B	f
$m_0 = A'B'$	0	0	1
$m_1 = A'B$	0	1	0
$m_2 = AB'$	1	0	1
$m_3 = AB$	1	1	1

Max terms

Maxterm	A	B	f
$M_0 = A+B$	0	0	1
$M_0 = A+B'$	0	1	0
$M_0 = A'+B$	1	0	1
$M_0 = A'+B'$	1	1	1



Relation in between m_i & M_i

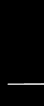
AB

$$00 \longrightarrow m_0 = A' \cdot B' \longrightarrow M_0 = A + B$$

$$01 \longrightarrow m_0 = A' \cdot B \longrightarrow M_0 = A + B'$$

$$10 \longrightarrow m_0 = A \cdot B' \longrightarrow M_0 = A' + B$$

$$11 \longrightarrow m_0 = A \cdot B \longrightarrow M_0 = A' + B'$$

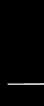


SoP and PoS

Maxterm	Minterm	A	B	f
$M_0 = A+B$	$m_0 = A'B'$	0	0	1
$M_1 = A+B'$	$m_1 = A'B$	0	1	0
$M_2 = A'+B$	$m_2 = AB'$	1	0	1
$M_3 = A'+B'$	$m_3 = AB$	1	1	0

$$f = A'B' + AB'$$

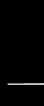
$$f = (A+B')(A'+B')$$



Karnaugh Map For Two Variables

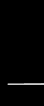
Maxterm	Minterm	A	B	f
$M_0 = A+B$	$m_0 = A'B'$	0	0	1
$M_1 = A+B'$	$m_1 = A'B$	0	1	0
$M_2 = A'+B$	$m_2 = AB'$	1	0	1
$M_3 = A'+B'$	$m_3 = AB$	1	1	0

A\B	0	1
0	m_0	m_1
1	m_2	m_3



Karnaugh Map For Two Variables

A\B	0	1
0	m_0	m_1
1	m_2	m_3



Express function in K-Map

$$F = AB + A'B'$$

A\B	0	1
0		
1		



Express TT in K-Map

A	B	C
0	0	
0	1	
1	0	
1	1	

A\B	0	1
0		
1		



Reduce through K-Map

A\B	0	1
0		
1		

