Karnaugh Maps

Module 5

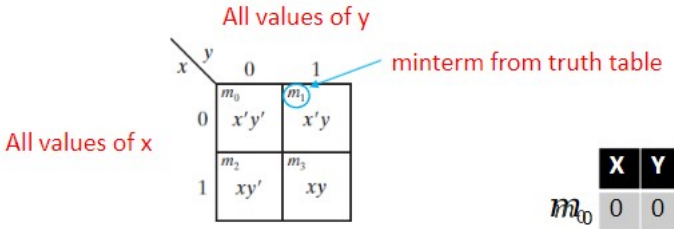
9/25/23

1 K maps

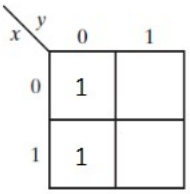
- Gives a graphical method to find a simplified logic circuit
- used to create an SOP or POS circuit from truth table

With minterms:

- Shows the possible minterms values for iputs x and y
- A square for each output of truth table, mark each square where a 1 occurs on truth table



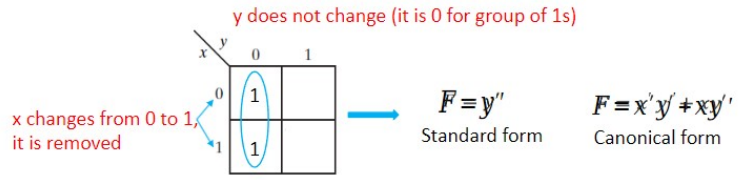
	X	Y	F
m_0	0	0	1
	0	1	0
m_2	1	0	1
	1	1	0



Only fill in minterms on K-map

Simplifying K amp

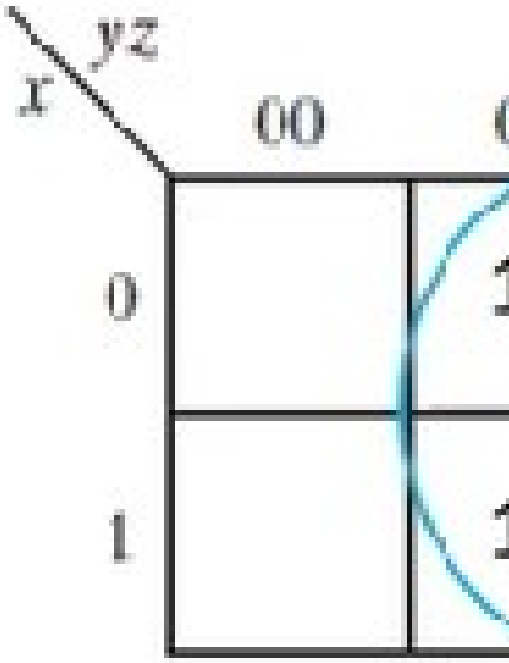
- Group as many 1s in powers of two that are adjacent vertically & horizontally (diagonals are not permitted).
- Observe the input value of the variable between each group of 1s: if it changes →`remove the variable`, if it doesn't change →`keep that variable`.
- Isolated 1s do not simplify
- Variables that stay are `AND`ed together in a group of 1s. All groups of 1s are ORed together.



Avoid redundancy

- A redundant group is captured if all 1s in said group are a part of another. Overlap is fine, so long as it's not redundant.
- **Redundant circling is not simplified in Karnaugh maps**.

Groups of 4 1s



group A simplifies to z and group B simplifies to xy