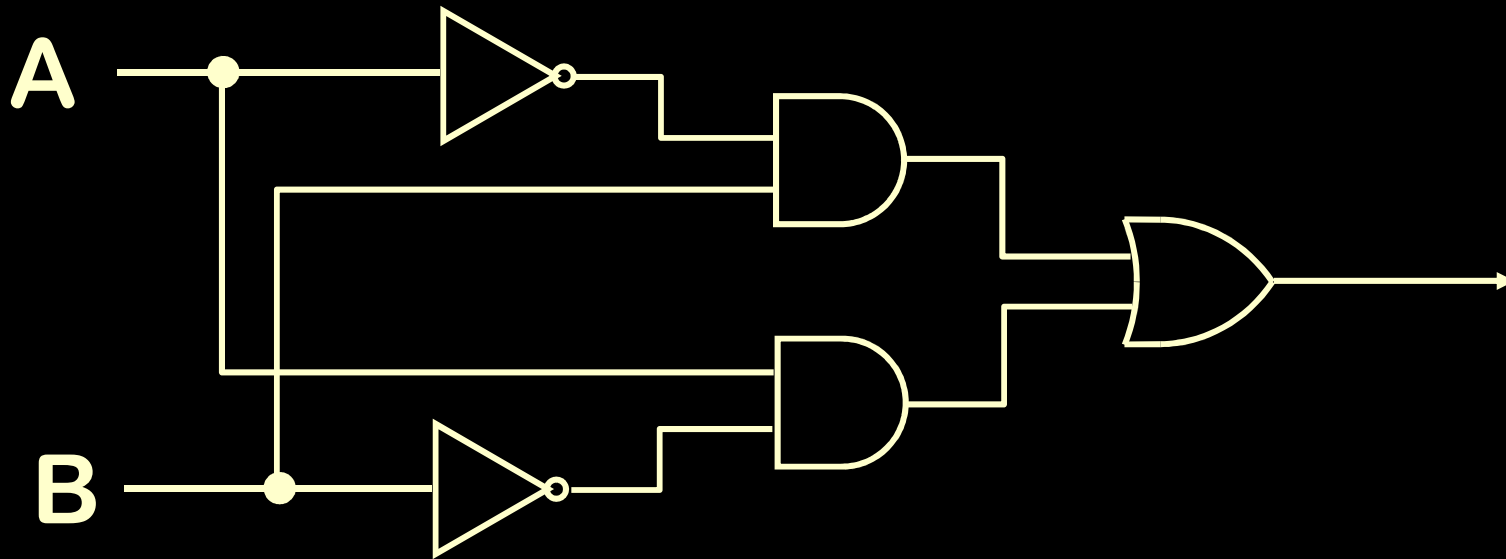


Property of Boolean Algebra



$$A \oplus B = A'B + AB'$$



Properties of Boolean Algebra

AND

$$A(1) = A$$

$$AB = BA$$

$$(AB)C = A(BC)$$

$$A(B+C) = AB + AC$$

OR

$$A+0 = A$$

$$A+B = B+A$$

$$(A+B)+C = A+(B+C)$$

$$A+BC = (A+B)(A+C)$$

*Distributive
Property*



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$$\begin{aligned} &= AA + BA + AC + BC \\ &= A + A(B+C) + BC \\ &= A(1) + A(B+C) + BC \\ &= A(1+(B+C)) + BC \\ &= A(1) + BC \\ &= A + BC \end{aligned}$$



Properties of Boolean Algebra

AND

$$A(1) = A$$

$$AB = BA$$

$$(AB)C = A(BC)$$

$$A(B+C) = AB + AC$$

$$AA = A$$

$$AA' = 0$$

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

OR

$$A+0 = A$$

$$A+B = B+A$$

$$(A+B)+C = A+(B+C)$$

$$A+BC = (A+B)(A+C)$$

$$A+A = A$$

$$A+A' = 1$$

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

DeMorgan's Laws



Properties of Boolean Algebra

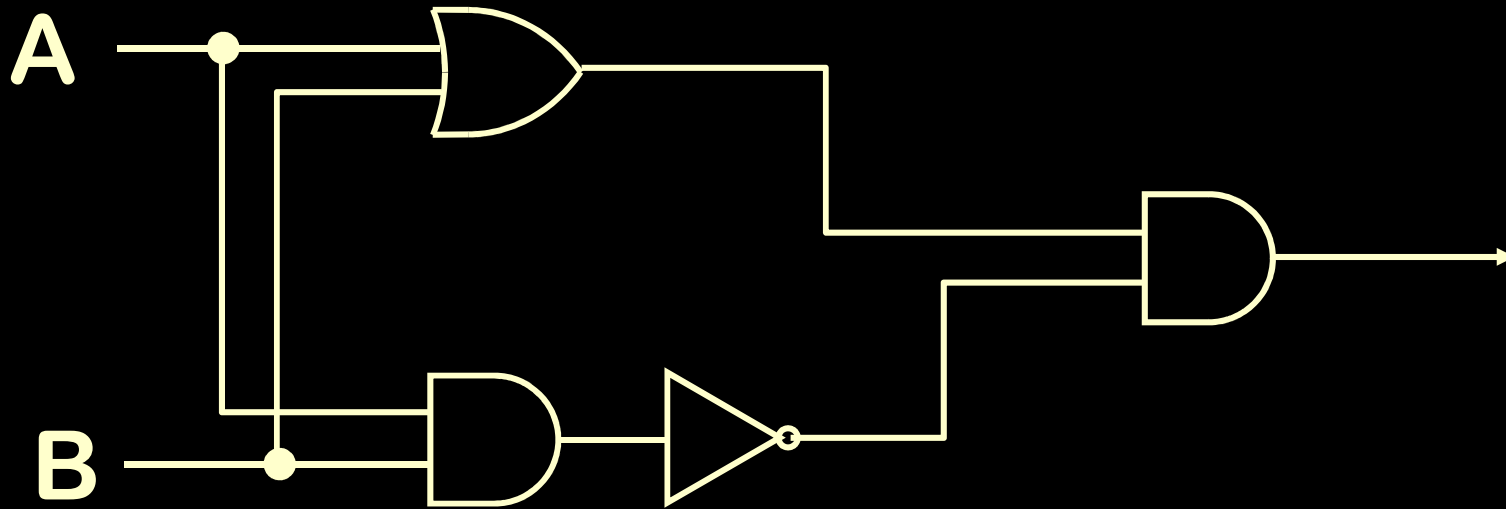
XOR

$$A \oplus B = AB' + A'B$$

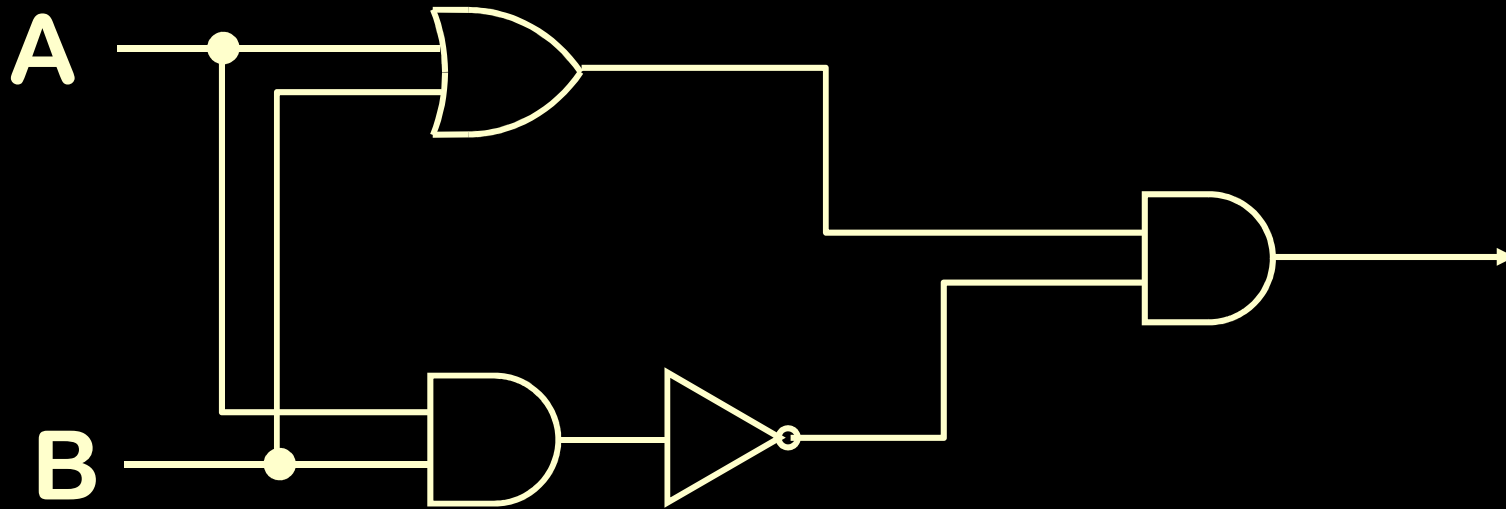
$$(A \oplus B)' = AB + A'B'$$



Is this an XOR?



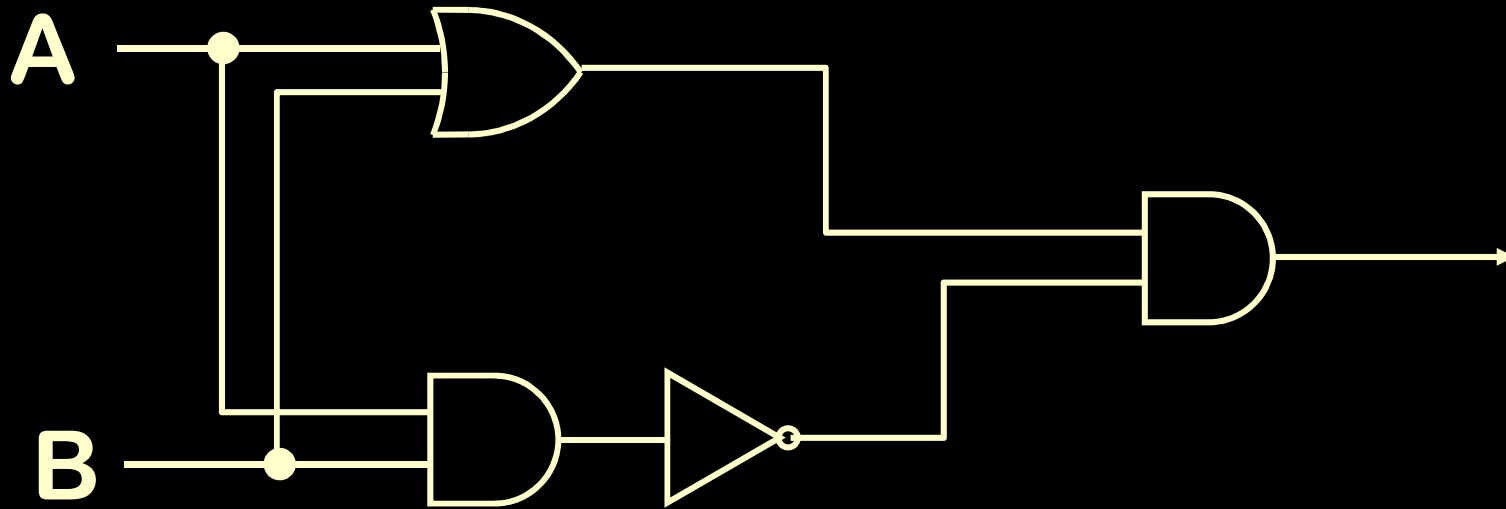
Is this an XOR?



$$\begin{aligned} & (A+B)(AB)' \\ &= (A+B)(A'+B') \\ &= AA' + BA' + AB' + BB' \\ &= BA' + AB' \\ &= A \oplus B \end{aligned}$$



Is this an XOR?



$$(A+B)(AB)' = A \oplus B$$

Yep!

