

Organización de Computadoras

Transformaciones de Compuertas

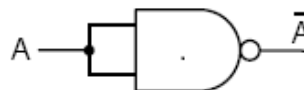
Curso 2020

Prof. Jorge Runco

Construir un NOT con NAND

$$F = A.B = A.A = \bar{A}$$

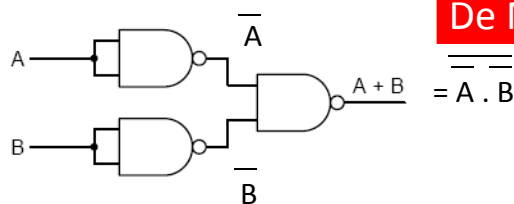
Idempotencia



Construir un OR con NAND

Doble
Negación

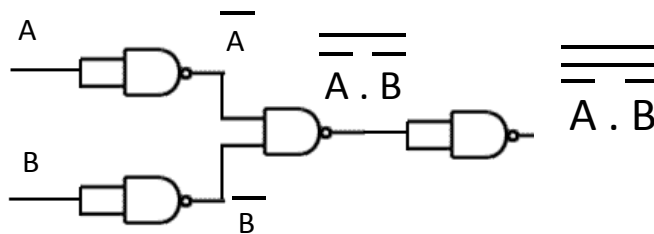
$$F = A + B = \overline{\overline{A + B}} = \overline{\overline{A} \cdot \overline{B}}$$



De Morgan

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Construir un NOR con NAND



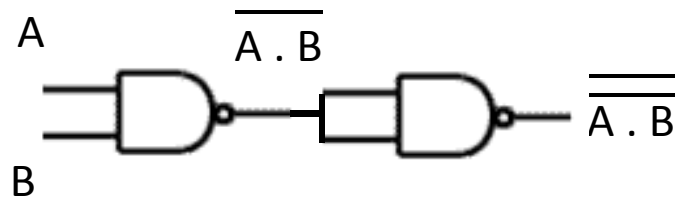
Doble
Negación

$$F = \overline{A + B} = \overline{\overline{\overline{A} \cdot \overline{B}}} = \overline{\overline{A} \cdot \overline{B}}$$

De Morgan

4

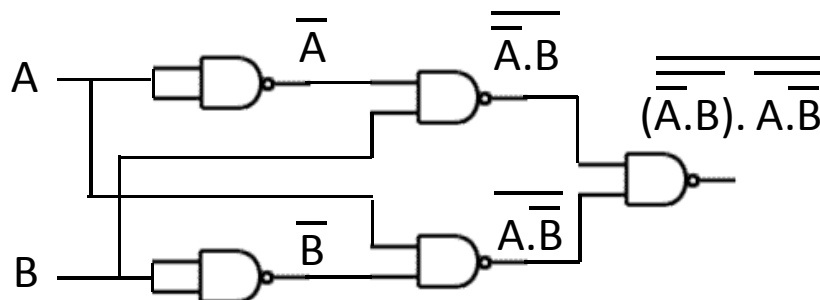
Construir un AND con NAND



$$F = A \cdot B = \overline{\overline{A \cdot B}}$$

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Construir un XOR con NAND



$$F = A \oplus B = \overline{\overline{A}} \cdot B + A \cdot \overline{\overline{B}} = \overline{\overline{(\overline{\overline{A}} \cdot B) \cdot (A \cdot \overline{\overline{B}})}} = \overline{\overline{(\overline{A \cdot B}) \cdot (\overline{A \cdot B})}}$$

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Construire un NOT con NOR

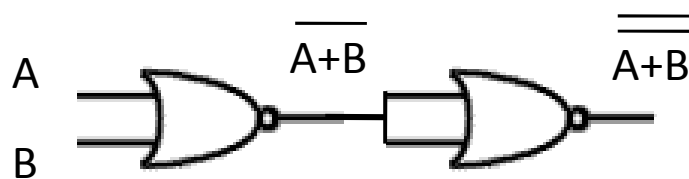
$$F = \overline{A+B} = \overline{A+A} = \overline{A}$$



7

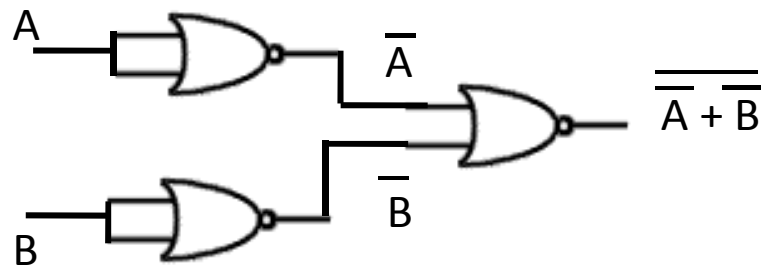
Construire un OR con NOR

$$F = \overline{\overline{A+B}}$$



8

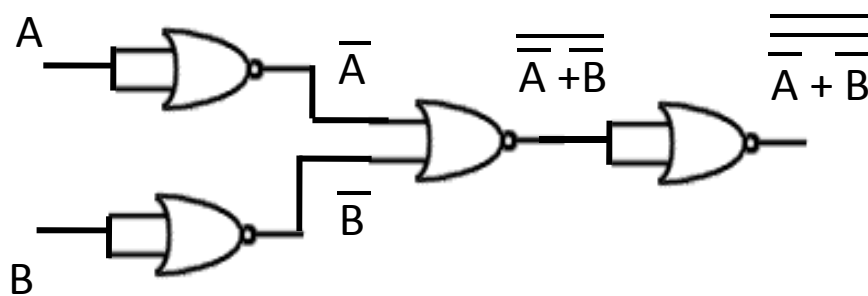
Construire un AND con NOR



$$F = A \cdot B = \overline{\overline{A} \cdot \overline{B}} = \overline{\overline{A} + \overline{B}}$$

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Construire un NAND con NOR



$$F = \overline{A \cdot B} = \overline{\overline{A} + \overline{B}} = \overline{\overline{\overline{A} + \overline{B}}}$$

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Construire un XOR con NOR

$$\begin{aligned}
 F = A \oplus B &= \overline{A} \cdot B + A \cdot \overline{B} = \overline{\overline{\overline{\overline{A} \cdot B}}} + \overline{\overline{\overline{\overline{A \cdot \overline{B}}}}} = \\
 &\overline{\overline{\overline{\overline{A+B}}} + \overline{\overline{\overline{\overline{A+B}}}}} = \overline{\overline{\overline{A+B}}} + \overline{\overline{\overline{\overline{A+B}}}} = \\
 &= \overline{\overline{\overline{\overline{A+B}}} + \overline{\overline{\overline{\overline{A+B}}}}}
 \end{aligned}$$

