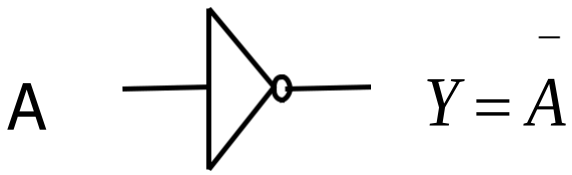
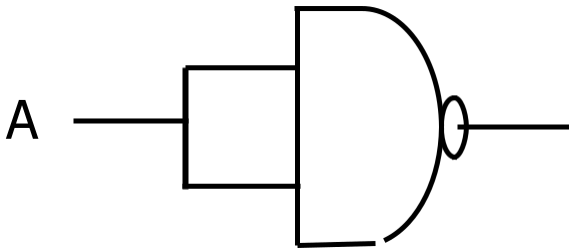
Universal Gate

NOT Gate using NAND Gate



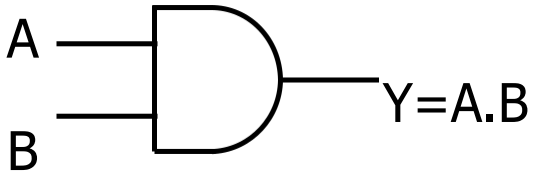


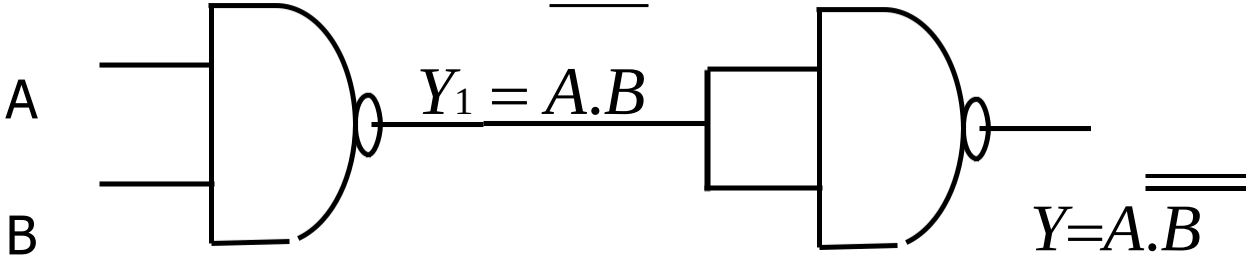
$Y = A.\overline{A}$

$Y = \bar{A}$ ..... (A.A=A)

Universal Gate

AND Gate using NAND Gate

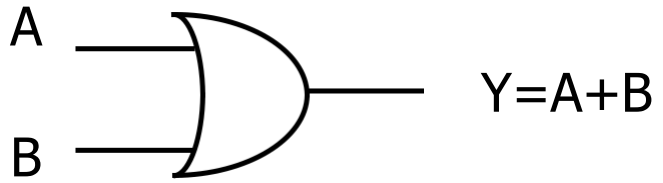


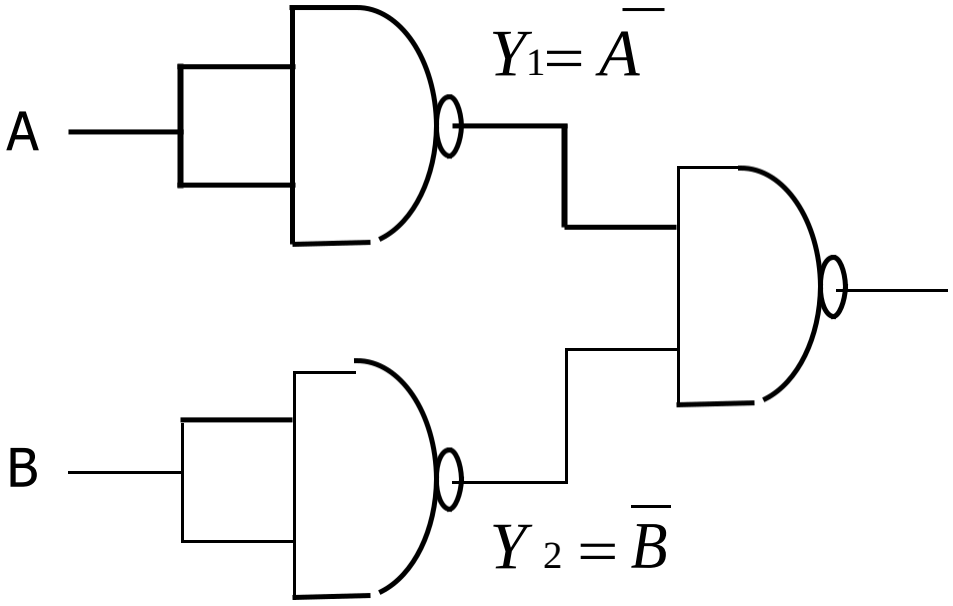


$$Y = \overline{\overline{A.B}} \because (\overline{\overline{A}} = A)$$

Universal Gate

OR Gate using NAND Gate





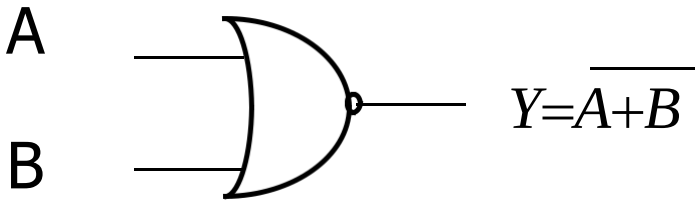
$$Y = \overline{\overline{A}.\overline{B}}$$

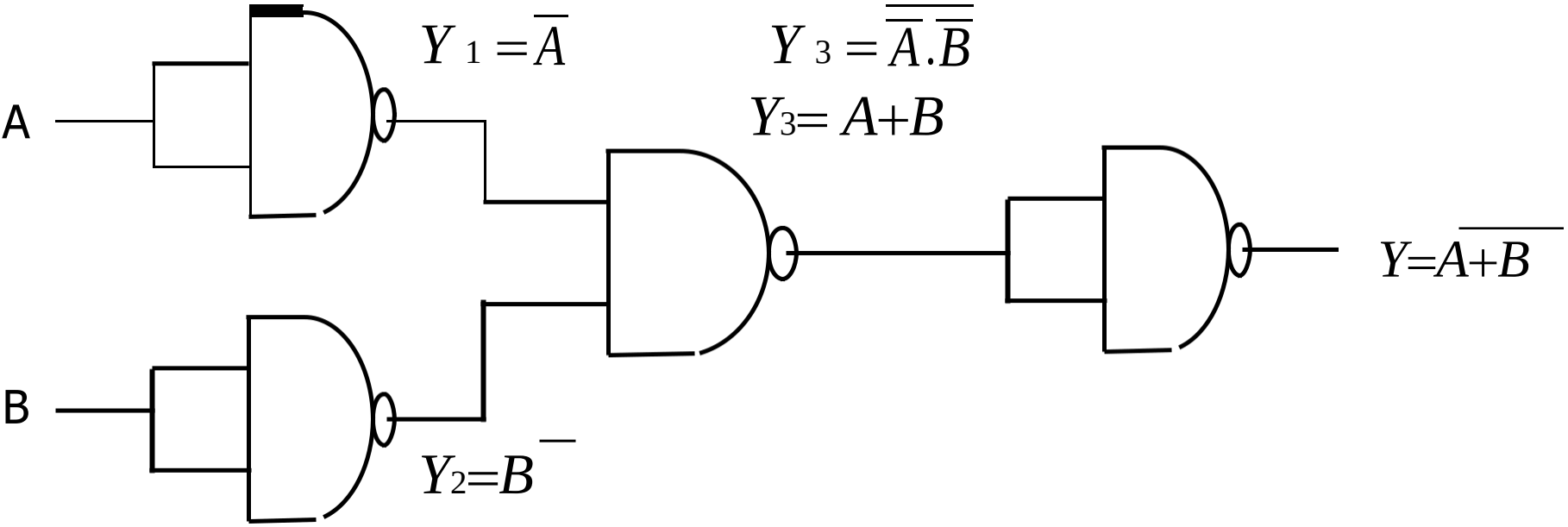
$$Y = \overline{\overline{A}} + \overline{\overline{B}} \quad (\because \text{Demorgan's Theorem})$$

$$Y = A + B$$

Universal Gate

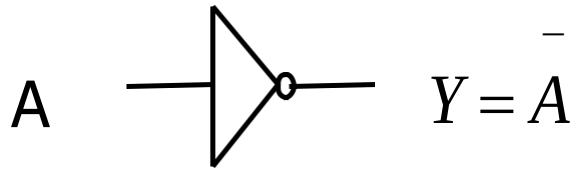
NOR Gate using NAND Gate

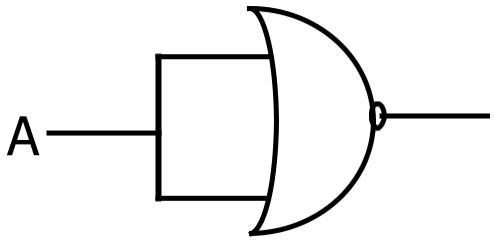




Universal Gate

NOT Gate using NOR Gate



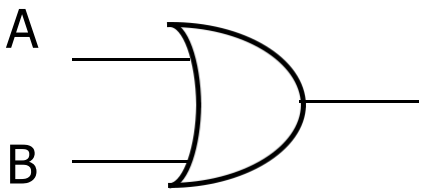


$$Y = \overline{A+A}$$

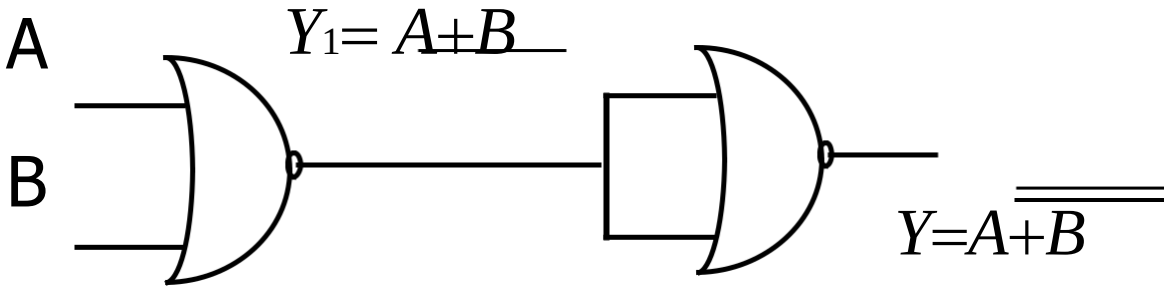
$$Y = \bar{A} \quad \text{..... (A+A=A)}$$

Universal Gate

OR Gate using NOR Gate



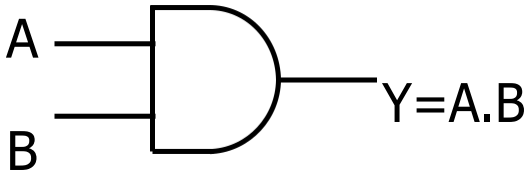
$Y=A+B$

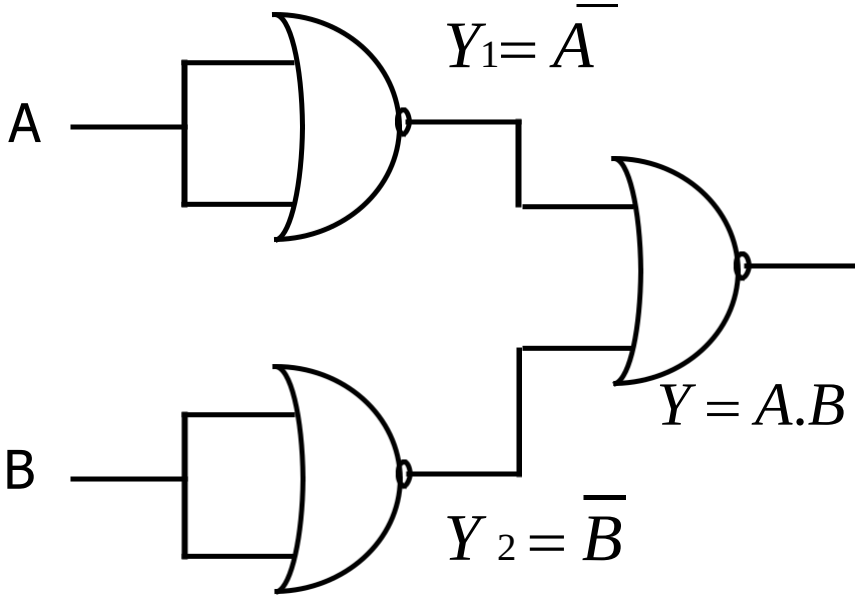


$Y = A+B \qquad (\because \overline{\overline{A}}=A)$

Universal Gate

AND Gate using NOR Gate





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

$= =$

($\because$ Demorgan's Theorem)

$Y = A.B$

Universal Gate

NAND Gate using NOR Gate