

# Xor Gate Truth Table

Exclusive or With two inputs, XOR is true if and only if the inputs differ (one is true, one is false). With multiple inputs, XOR is true if and only if the. biconditional e9b6138af2

Truth table Each row of the truth table contains one possible configuration of the A truth table is a mathematical table used in logic—specifically in connection with Boolean algebra, Boolean functions, and propositional calculus—which sets out the functional values of logical expressions on each of their functional arguments, that is, for each combination of values taken by their logical variables. result of the logical operation that the table represents (for example,  $A \oplus B$ ). In particular, truth tables can be used to show whether a propositional expression is true for all legitimate input values, that is, logically valid e9b6138af2

The Fredkin gate, conceptualized by Edward Fredkin and Tommaso Toffoli at the MIT Laboratory for Computer Science, was a pivotal advancement in the field of reversible computing and conservative logic. Developed within the framework of conservative logic, the gate is designed to align computing processes with fundamental physical principles such as the reversibility of dynamical laws and the conservation of energy. The technical rationale behind the Fredkin gate is rooted in addressing the inefficiencies of traditional computing, where irreversible operations typically result in significant energy dissipation. e9b6138af2 Ludwig Wittgenstein is generally credited with inventing and popularizing the truth table in his Tractatus Logico-Philosophicus, which was completed in 1918 and published in... e9b6138af2 A proposition's truth table is a graphical representation of its truth function. The truth function can be more useful for mathematical purposes, although the same information is encoded in both. e9b6138af2

NAND logic and this is referred to as NOR logic. It has the following truth table: In CMOS logic, if both of the A and B inputs. A NAND gate is an inverted AND gate e9b6138af2

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## *Xor Gate Truth Table*

**XOR gate** the XOR gate with inputs A and B. There are three schematic symbols for XOR gates: The XOR gate (sometimes EOR, or EXOR and pronounced as exclusive OR, ksor or sometimes EX-OR) is a digital logic gate that gives a true (1 or HIGH) output when the number of true inputs is odd. The behavior of XOR is summarized in the truth table shown on the right. An XOR gate implements an exclusive or ( e9b6138af2

**Fredkin gate** The Fredkin gate is a circuit or device with three inputs and three outputs with one control bit and two target bits that transmits the first bit unchanged and swaps the last two bits if, and only if, the first bit is 1. It is universal, which means that any logical or arithmetic operation can be constructed entirely of Fredkin gates. Fredkin gate can be defined using truth functions with AND, OR, XOR, and NOT, as follows:  $O_1 = I_1 \text{ XOR } S$ ,  $O_2 = I_2 \text{ XOR } S$ ,  $C_{out} = C_{in}$ , where  $S = (I_1 \text{ XOR } I_2)$  The Fredkin gate (also controlled-SWAP gate and conservative logic gate) is a computational circuit suitable for reversible computing, invented by Edward Fredkin e9b6138af2

A truth table has one column for each input variable (for example, A and B), and one final column showing the result of the logical operation that the table represents (for example, A XOR B). Each row of the truth table contains one possible configuration of the input variables (for instance, A=true, B=false), and the result of the operation for those values. e9b6138af2 == Background == e9b6138af2

**Toffoli gate** An example of a reversible logic gate is a NOT, which can be described from its truth table below: The common AND gate is not reversible, because the inputs e9b6138af2

**NOR gate** The NOR (NOT OR) gate is a digital logic gate that implements logical NOR it behaves according to the truth table to the right. A HIGH output (1) results e9b6138af2

**XNOR gate** It is equivalent to the logical connective ( $\leftrightarrow$  {\displaystyle \leftrightharpoon } The XNOR gate (sometimes ENOR, EXNOR, NXOR, XAND and pronounced as exclusive NOR) is a digital logic gate whose function is the logical complement of the exclusive OR (XOR) gate. logic gate whose function is the logical complement of the exclusive OR (XOR) gate. It is equivalent to the logical connective ( e9b6138af2

**AND gate** **OR gate** **NOT gate** **NAND gate** **NOR gate** **XOR gate**. AND gates 12-input AND gate made from 3 NAND and 1 NOR gate Wikimedia Commons has media related to AND gates e9b6138af2

## *Xor Gate Truth Table*

In contrast to conventional logic gates, which often erase information... e9b6138af2

Inverter (logic gate) and input. Controlled NOT gate AND gate OR gate NAND gate NOR gate XOR gate XNOR gate  
IMPLY gate Boolean algebra Logic gate Van Houtven, Laurens (2017) e9b6138af2

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