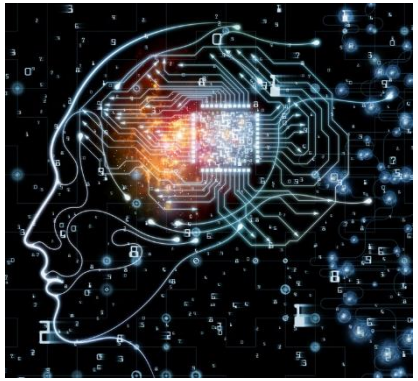
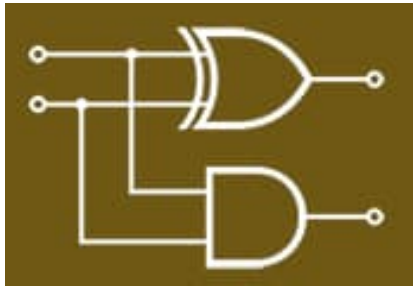
Logic Gates





Digital Logic and Design

Arfan Shahzad

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Course Outline

Digital Logic Design
Course Contents:
Number Systems, Logic Gates, Boolean Algebra, Combination logic circuits and designs, Simplification Methods (K-Map, Quinn Mc-Cluskey method), Flip Flops and Latches, Asynchronous and Synchronous circuits, Counters, Shift Registers, Counters, Triggered devices & its types. Binary Arithmetic and Arithmetic Circuits, Memory Elements, State Machines. Introduction Programmable Logic Devices (CPLD, FPGA); Lab Assignments using tools such as Verilog HDL/VHDL, MultiSim
Reference Material:
1. Digital Fundamentals by Floyd, 11/e. 2. Fundamental of Digital Logic with Verilog Design, Stephen Brown, 2/e.

Logic Gates

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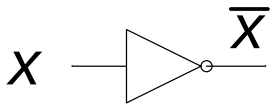

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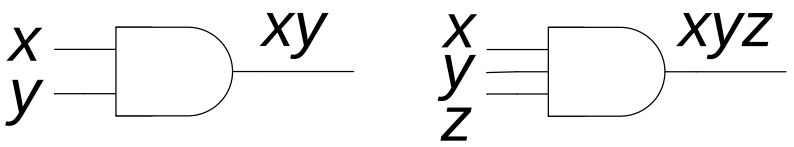

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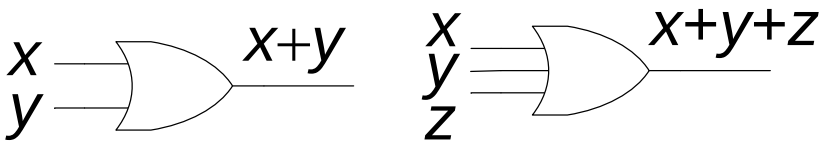

Logic Gates cont

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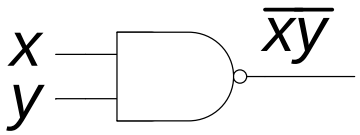

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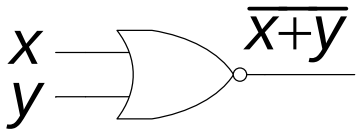

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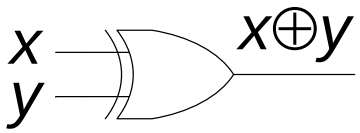
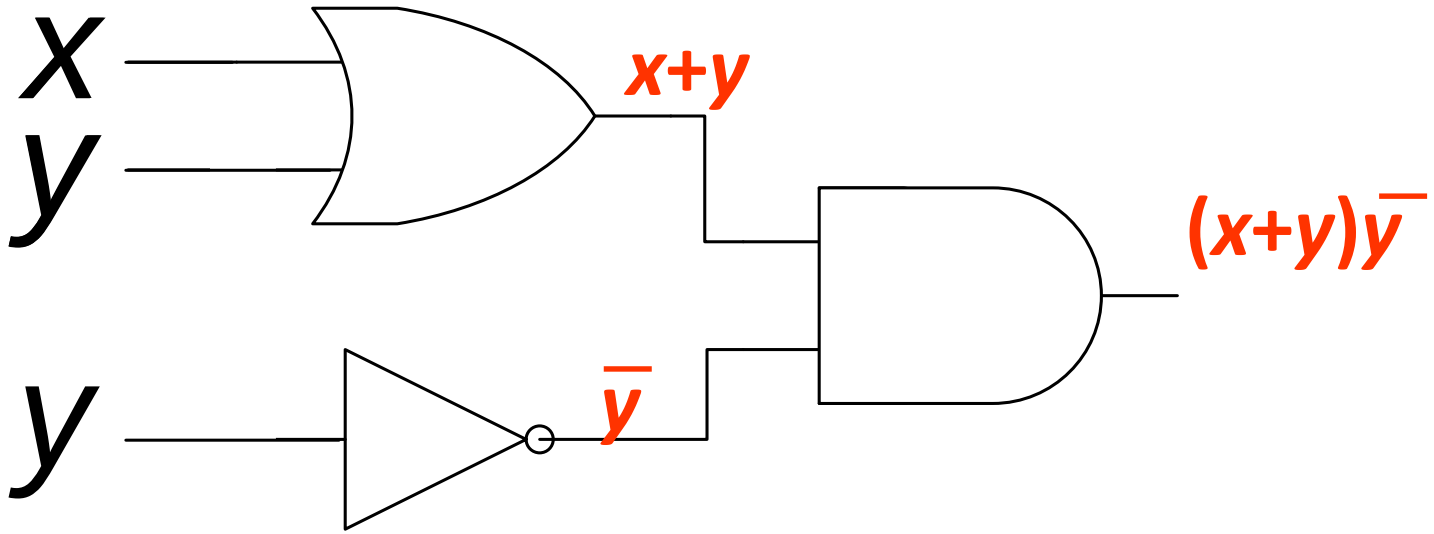


Logic Gates cont
Conversion between circuits and equations

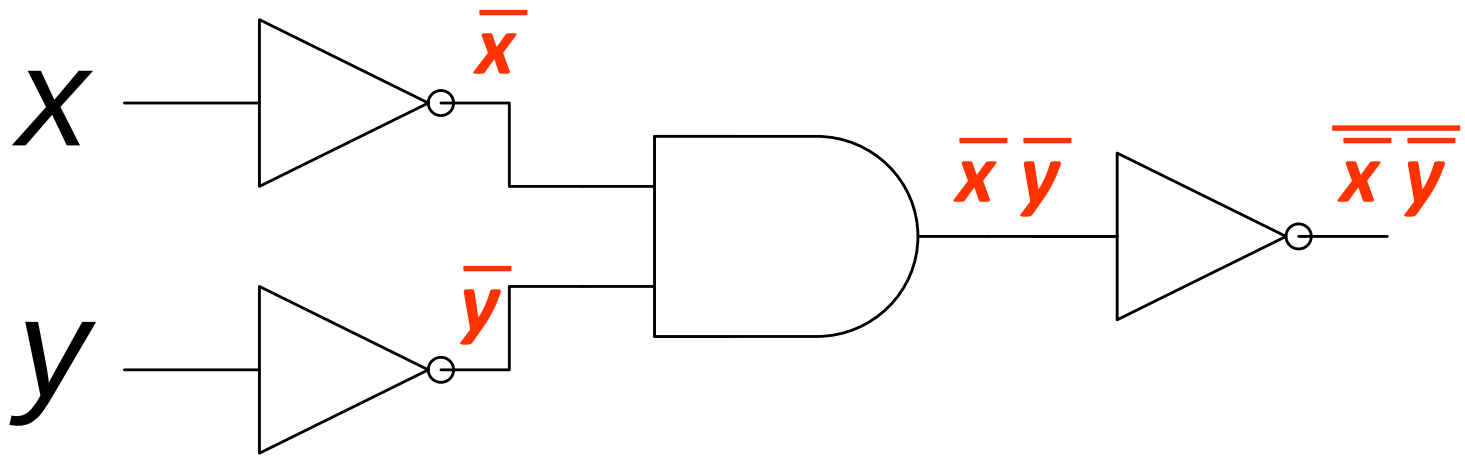
- Find the output of the following circuit



- Answer: $(x+y)\overline{y}$ / Or $(x \vee y) \wedge \neg y$

Logic Gates cont
Conversion between circuits and equations

- Find the output of the following circuit



Answer: $\overline{\overline{x}\overline{y}}$ / Or $\neg(\neg x \wedge \neg y) \equiv x \vee y$

Logic Gates cont
Conversion between circuits and equations

- Write the circuits for the following Boolean algebraic expressions
- $\overline{(x+y)}x$