CSL 302 Digital Logic & Computer Organization and Architecture

Aim – Basic gates using universal gates.

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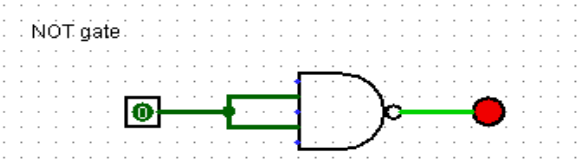
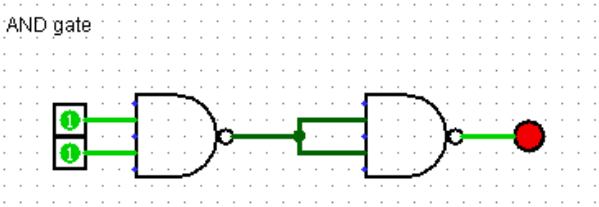
- **Universal gates -**
  - AND, OR, NOT are called basic gates as their logical operation cannot be simplified further.
  - NAND and NOR are called universal gates as using only NAND or only NOR, any logic function can be implemented.

- **Implementation of NAND gate using -**

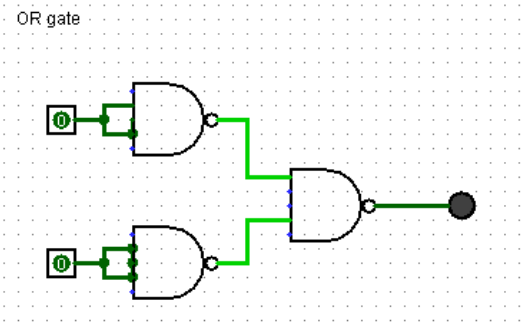
1. **NOT gate**



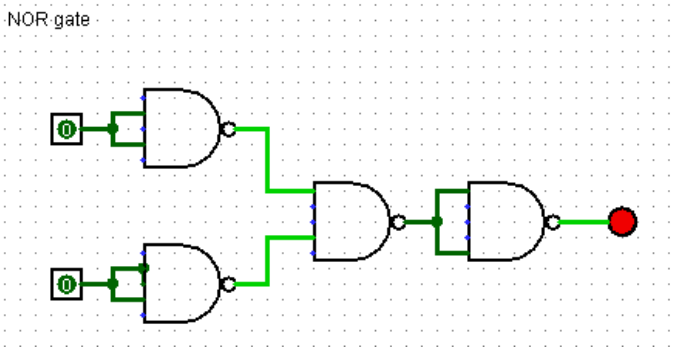
1. **AND gate**



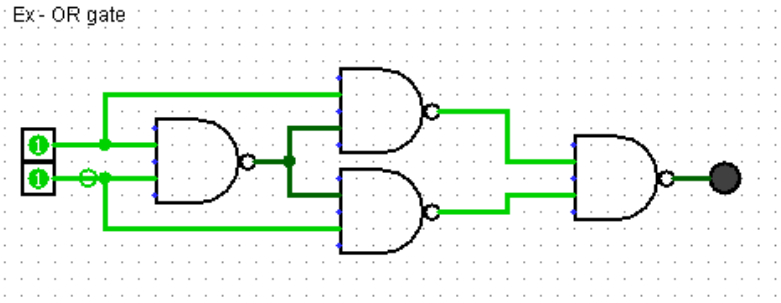
2. **OR gate**



3. NOR gate



4. Ex – OR gate



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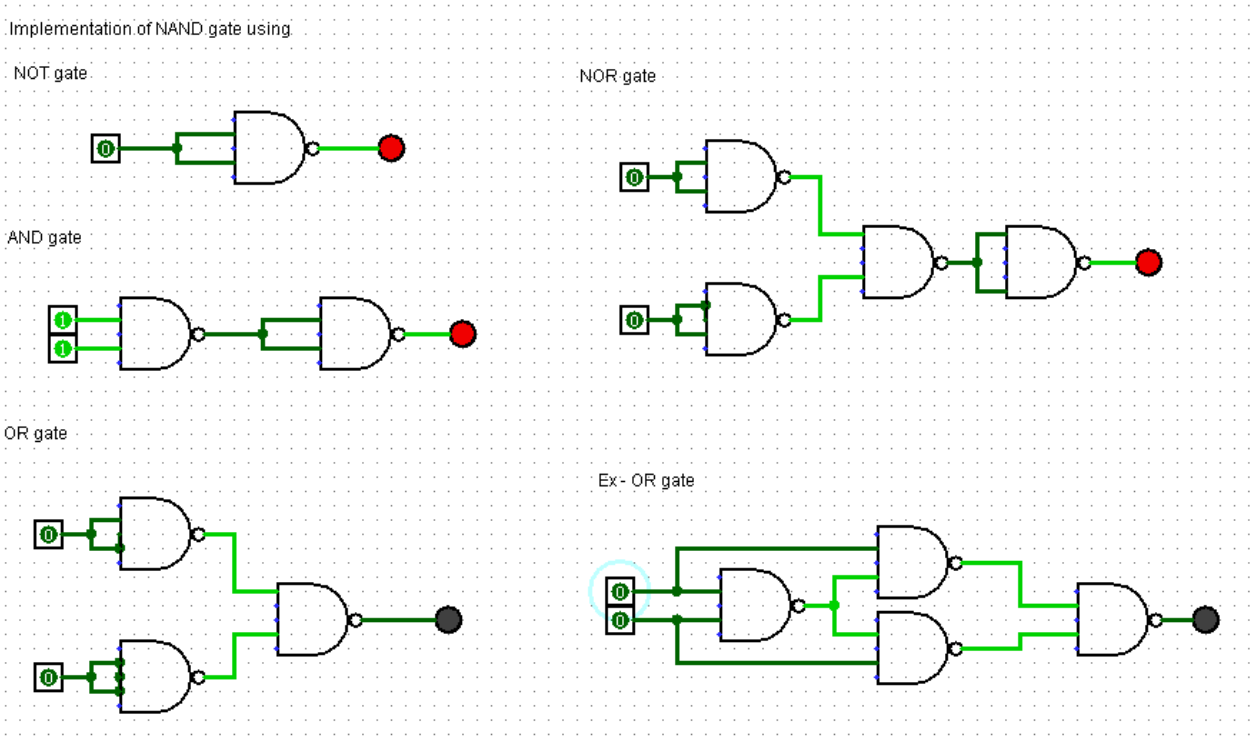
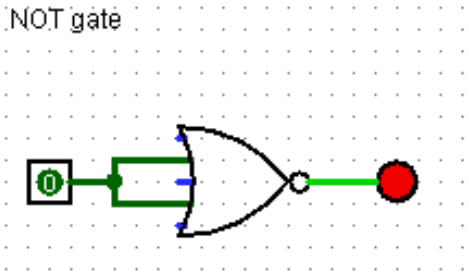
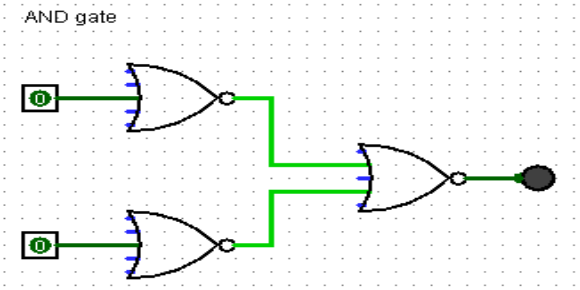


- **Implementation using NOR gate**

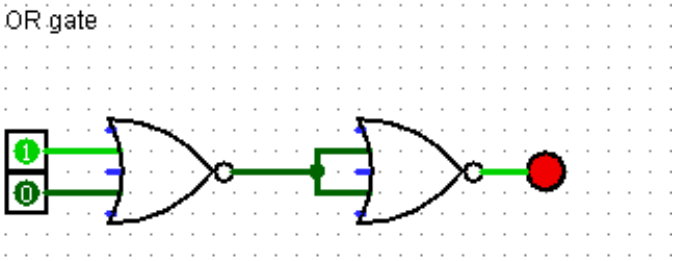
1. **NOT gate**



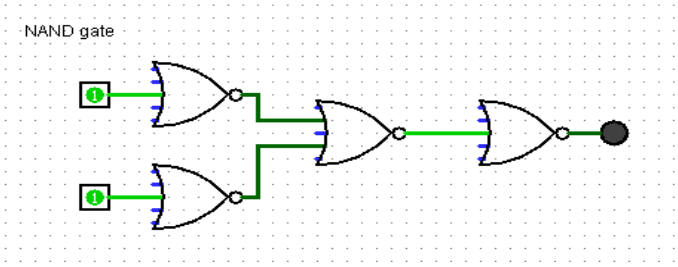
2. **AND gate**



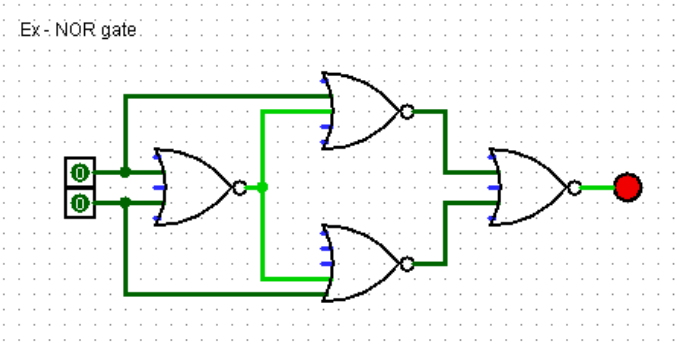
3. **OR gate**



4. **NAND gate**



5. Ex- NOR gate



Using Logisim software -