Green University of Bangladesh

Department of Computer Science and Engineering

Lab report-02

Course Title: Digital Logic Design Lab

Course code: CSE-204

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Tittle: Verification of Universal Logic Gates (NAND, NOR, EX-OR)

Objectives: To implement all individual gates with universal gates NAND ,NOR & EX-OR

Apparatus Required:

IC 7400 , 7402 , 7486

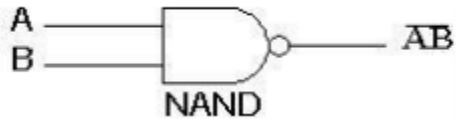
Equipment:

1. Power supply
2. Bread Board.

Theory:

To realize the Basic Logic Gates using NAND Gate:

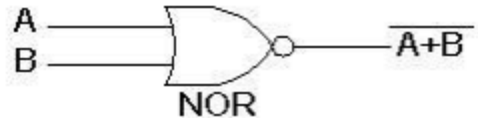
The NAND and NOR gates are called universal functions since with either one the AND and OR functions and NOT can be generated. A function in sum of products form can be implemented using NAND gates by replacing all AND and OR gates by NAND gates. The outputs of all NAND gates are high if any of the inputs are low. The logic symbol of NAND Gate is shown in Fig.



Realize the EX-OR gate using NAND Gate:

To realize the Basic Logic Gates using NOR Gate:

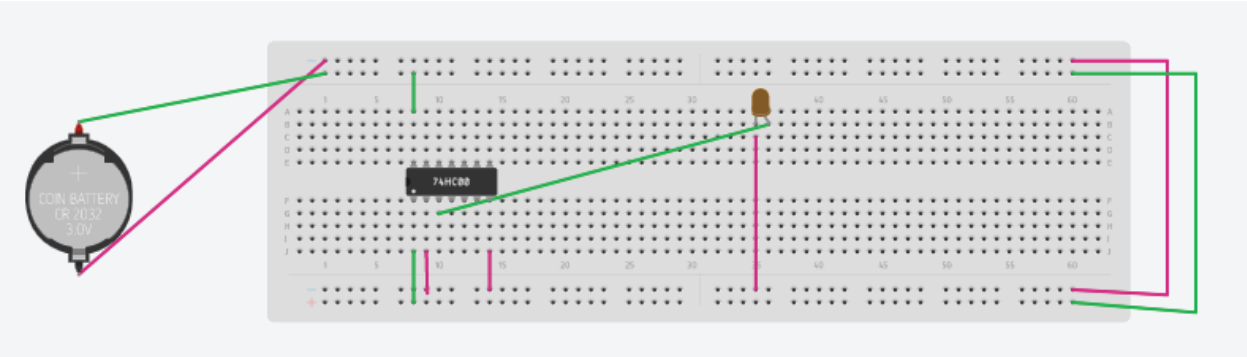
The NOR gate is called universal gate since with this gate AND, OR & NOT functions and can be generated. A function in product of sums form can be implemented using NOR gates by replacing all AND and OR gates by NOR gates. The outputs of all NOR gates are high if any of the inputs are HIGH. The logic symbol of NOR Gate is shown in Fig.

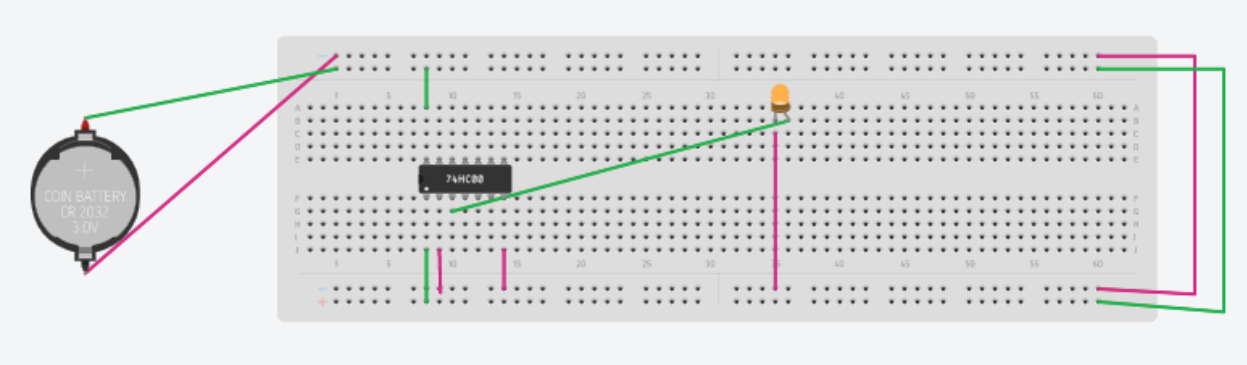


EX-OR Gate:

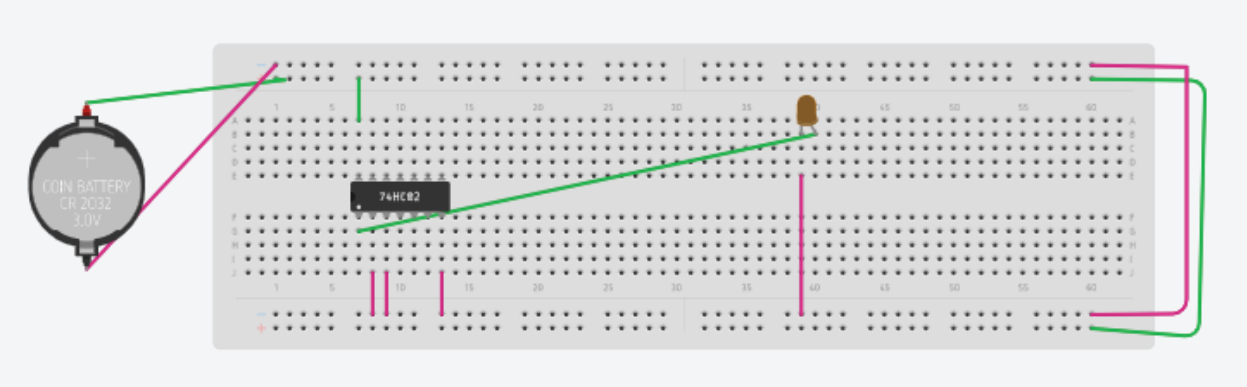
The 'Exclusive-OR' gate is a circuit which will give a high output if either, but not both, of its two inputs are high .The IC 74LS86 is a single input EXOR Gate IC and it consists of 4- EXOR gates. The logic symbol of EXOR Gate is shown in Fig.

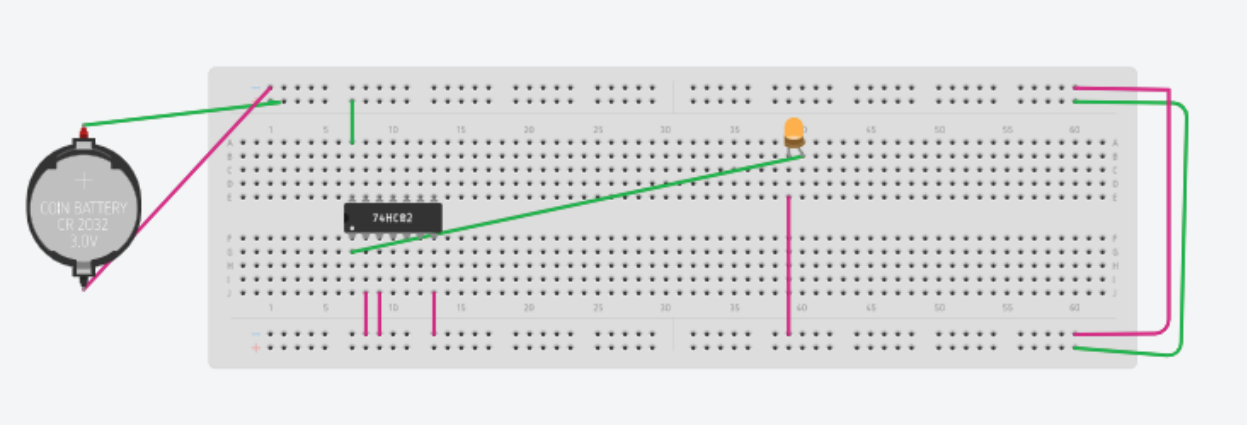
NAND Gate:



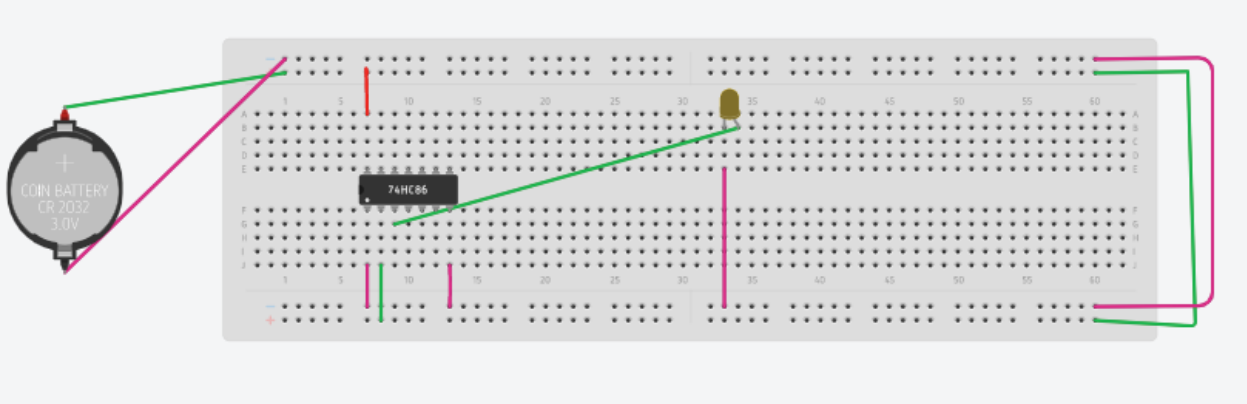


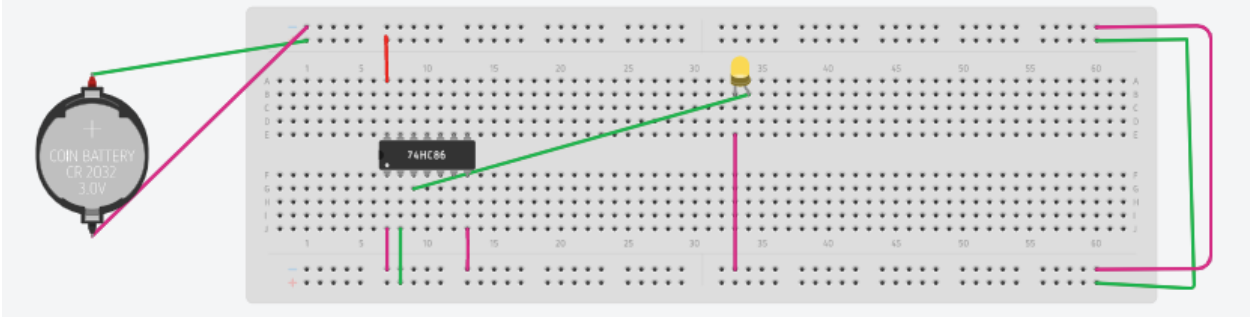
NOR Gate:





EX-OR Gate:





Discussion:

For logic gates we have applied proper grounding for IC's .We have used a straight lead probe to insert into the breadboard .We have inserted the components into the breadboard firmly .We didn’t touch the pins of IC's while power on also didn’t bend the pins of IC's