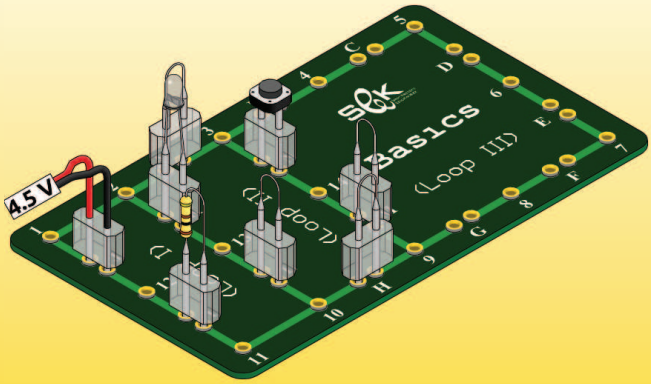
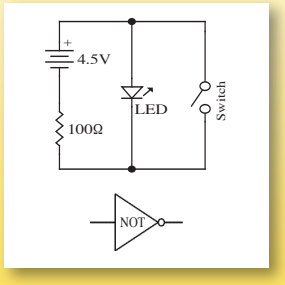
Experiment No. (37) NOT Logic Gate





Objectives:

1. The student will set up NOT logic gate using switches.
2. The student will set up NOT logic gate using diodes.
3. The student will proof by experiment the truth table of NOT logic gate.

Apparatus:

- Basics Board
- Voltage Source (PSB Board)
- Connection wire
- Resistor 100Ω
- Switch
- Jumpers
- LED
- Diode

Procedure and Conclusions:

1. Use Loop I & II on the Basics Board to set up a circuit by inserting a switch at the pair (N), a resistor 100Ω at the pair (I), LED at the pair (K) in a way that its positive terminal will be towards the point (2), and jumpers at the pairs (A, H, L, M).
2. Connect (4.5 volt) from PSB Board to the pair (J) using a connection wire in a way that the positive terminal (red wire) will be towards the point (1).
3. Press the switch button and see what happens to the LED.

- When the switch is open (switch button up), the LED … emits / doesn't emit … light, this indicates the logic value input … 0 / 1 …, and the logic value output … 0 / 1 … Record the results in the table below.
- When the switch is close (switch button pressed), the LED … emits / doesn't emit … light, and this indicates the logic value input … 0 / 1 …, and

the logic value output … 0 / 1 …. Record the results in the table below.

- **Truth table for NOT logic gate:**

Input	Output
0	
1	

NOT Logic Gate using a Diode:

4. Insert a diode at the pair (N) instead of the switch in a way that its positive terminal will be towards the point (3), (in this way, the diode is reverse-biased). See if the LED emits light.

- When the diode reverse-biased, the LED … emits / doesn't emit ... light, this indicates that the logic value input … 0 / 1 …, and the logic value output … 0 / 1 …. Record the results in the table below.

5. Reverse the diode at the pair (N) in a way that its positive terminal will be towards the point (14), (in this way, the diode is forward-biased). See if the LED emits light.

- When the diode is reverse-biased, the LED … emits / doesn't emit ... light, this indicates that the logic value input … 0 / 1 …, and the logic value output … 0 / 1 …. Record the results in the table below.

- **NOT logic Truth Table using a Diode:**

Input	Output
0 (Reverse-biased)	
1 (Forward-biased)	

Notes:

- If the switch is open (switch button up), the logic value input should be '1', and if the switch is close (switch button pressed), the logic value input should be '0'. If the LED emits light, the logic value output should be '1', and if the LED doesn't emit light, the logic value output should be '0'.