EC681 - Mini Project

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Under the Guidance

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Objective :

For this project, individuals will implement a password security system with help of some Logic Gates. The "**Digital Lock**" project will give individuals the opportunity to become familiar with using NOR and XOR logic gates within a circuit. The learning Objective of this project are :

- To use **X-OR** as a bit Comparators.
- Getting familiar with different Logic Gates.
- Using **NOR** gate as a controlled inverter.

Introduction **:**

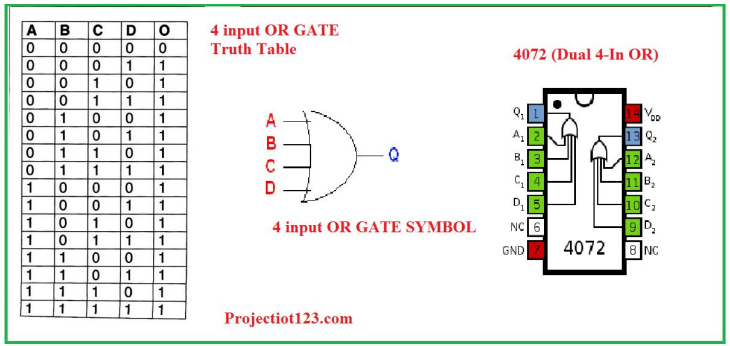
For this project, NOR and XOR gates, switches, LED's, and resistors are used within this project. The "key code" and "data entry" switches/logic state are the two four position DIP switches. Also, whenever a password in the "enter" switch is pressed in – the light will become either red if the password is incorrect or green if the password is correct. Above it all, individuals can receive alerts directly to his/her mobile devices each time a wrong password has been attempted.

Components Used :

- **1x 4-INPUT OR GATE**
- **3x 2-INPUT NOR GATE**
- **4x 2-INPUT XOR GATE**
- **12x RESISTOR**(10kohm)
- **2x4-POSITION DIP SWITCHES**
- **1x PUSH SWITCH**

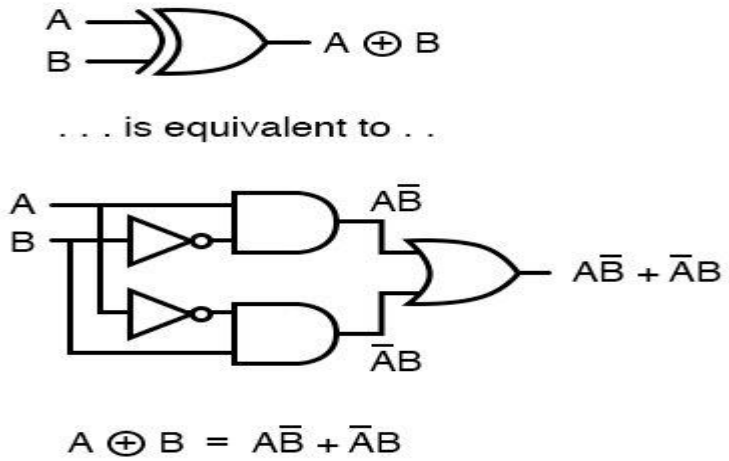
4 INPUT OR GATE :

The HCF4072B DUAL 4 INPUT OR GATE provides the system designer with direct implementation of the positive logic OR function and supplement the existing family of CMOS gates. It simply follows the function same as 2 input OR Gate except that the inputs here are 4. It gives logic “HIGH” when any one of the input is “HIGH”, and logic “LOW” when all inputs are “LOW”.



2 INPUT XOR GATE:

In this project we use XOR gate as a bit comparator.



Inputs		Output
A	B	X
0	0	0
0	1	1
1	0	1
1	1	0

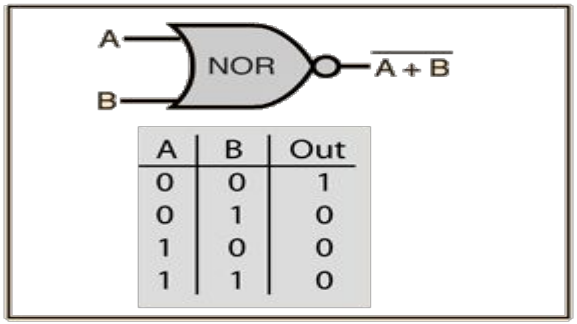
2 INPUT NOR GATE:

The output, Z of a “Logic NOR Gate” only returns “HIGH” again when **ALL** of its inputs are at a logic level “0”. In other words for a logic 2 input NOR gate, any “LOW” input or for both “HIGH” inputs will give a “LOW”, logic level “0” output.

The logic or Boolean expression given for a digital logic OR gate is that for *Logical Addition* which is denoted by a

plus sign, (+) giving us the

Boolean expression of: Z=(X+Y)’.



A	B	Out
0	0	1
0	1	0
1	0	0
1	1	0

DIP SWITCHES :

DIP switch with 4 individual switch positions. The pins have .1"(2.54mm) spacing - fits great into a breadboard! Works great as general control switches.

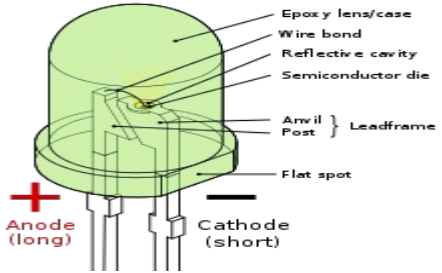
DIP Switch

Features:

- 4 individual switch positions
- 2.54mm pin spacing
- General control switches
- Here we can make 4 input **key code** and **Data entry** switch with the help of DIP switches.

LED :

A light-emitting diode is a semiconductor light source that emits light when current flows through it.Visible LEDs are used in many electronic devices as **indicator lamps**, in automobiles as rear-window and brake lights, and on billboards and signs as alphanumeric displays or even full-colour posters.In this circuit, we used two LED's of colour **RED** and **GREEN**. When output is 1, then the **RED** LED will glow up; and when the output is 0, then the **GREEN** LED will glow up.

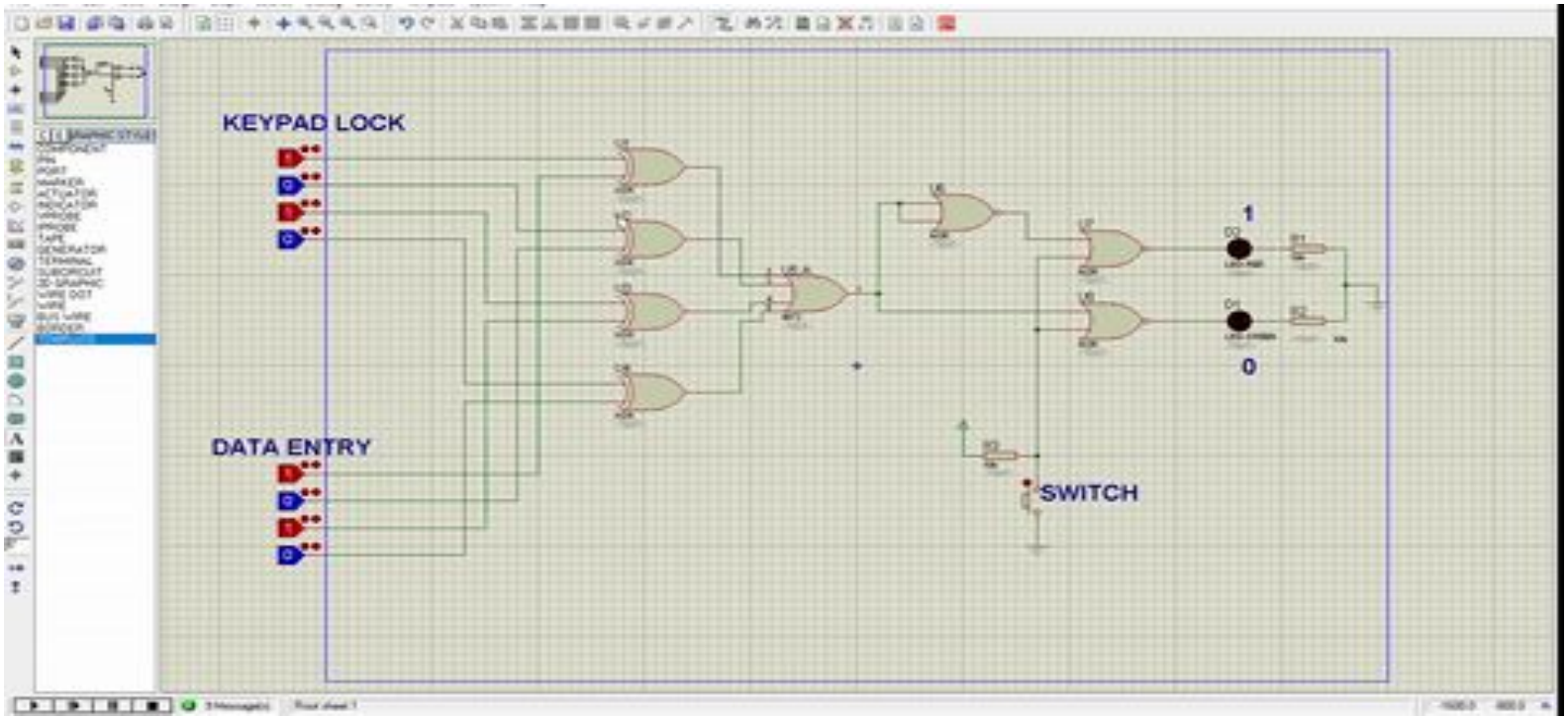


PUSH SWITCH:

A push switch (button) is **a momentary or non-latching switch which causes a temporary change in the state of an electrical circuit only while the switch is physically actuated**. ...

A 'push to make' switch allows electricity to flow between its two contacts when held in.

Practical:



Conclusion:

In our belief, we can confirm that the introduced system could be easily implemented and can be seen to be manufactured in large scale in upcoming future. It will prove the specificity, speciality and low cost of the system. This type of technologies will be very helpful for the person who is a self independent one particularly in case of partially disabled beings.

Acknowledgement:

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THANK YOU