KULLIYYAH OF ENGINEERING

DEPARTMENT OF MECHATRONICS ENGINEERING

MCTE 2332

DIGITAL SYSTEM AND MICROPROCESSOR

DLD PROJECT

Security Lock System using Binary-Code

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Introduction & Goal of the project

One of the cardinal needs of man is security of life and property. Over the centuries, access control systems were put in place to prevent access to unauthorized persons. They are called locks on doors. However, locks that are operated by keys have weaknesses such as the ability to be picked. Also, there are situations of unauthorized duplication of keys, the problem that a key has to be replaced if they are found missing. Furthermore, theft poses a very substantial problem. It is often necessary to change door locks when it is suspected that keys may have fallen into unauthorized hands. In the case of a fire hazard, when one needs to get out of the building quickly, it is not advisable to waste time searching for the key to unlock the door.

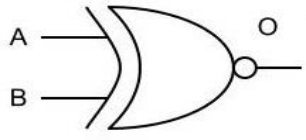
This paper, therefore, presents the design analysis of a security lock system using binary code and with the following design objectives:

- To gain access using the right code and remain locked if the right code is not entered.
- To reduce the number of intruders.
- To protect against unauthorized duplication of keys that operate hardware locks.

Design process

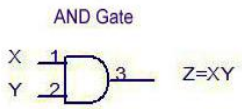
For the design process I design a circuit that has 11 input which is the switch, 5 input for setting password number and 5 input for the user to enter the password.

So for each number that we have set it must be the same in the input number from the user in the same order for example (the first number we set it must be the same as the first number the user input), after that every number we set we match it with an input number in a XNOR gate and this gate will be high only if the both input is high or low



A	B	O
0	0	1
0	1	0
1	0	0
1	1	1

So, after that all the XNOR gates will be connected into a AND gate

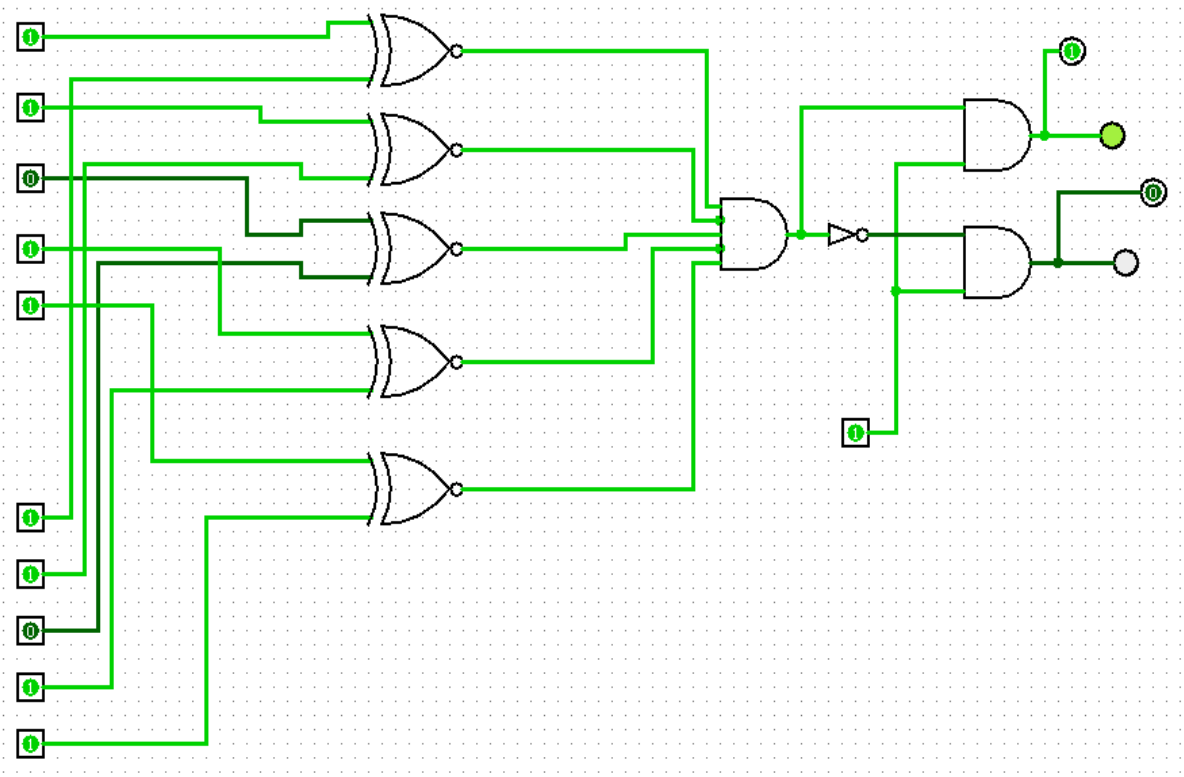


TRUTH TABLE

INPUTS		OUTPUT
X	Y	Z
0	0	0
0	1	0
1	0	0
1	1	1

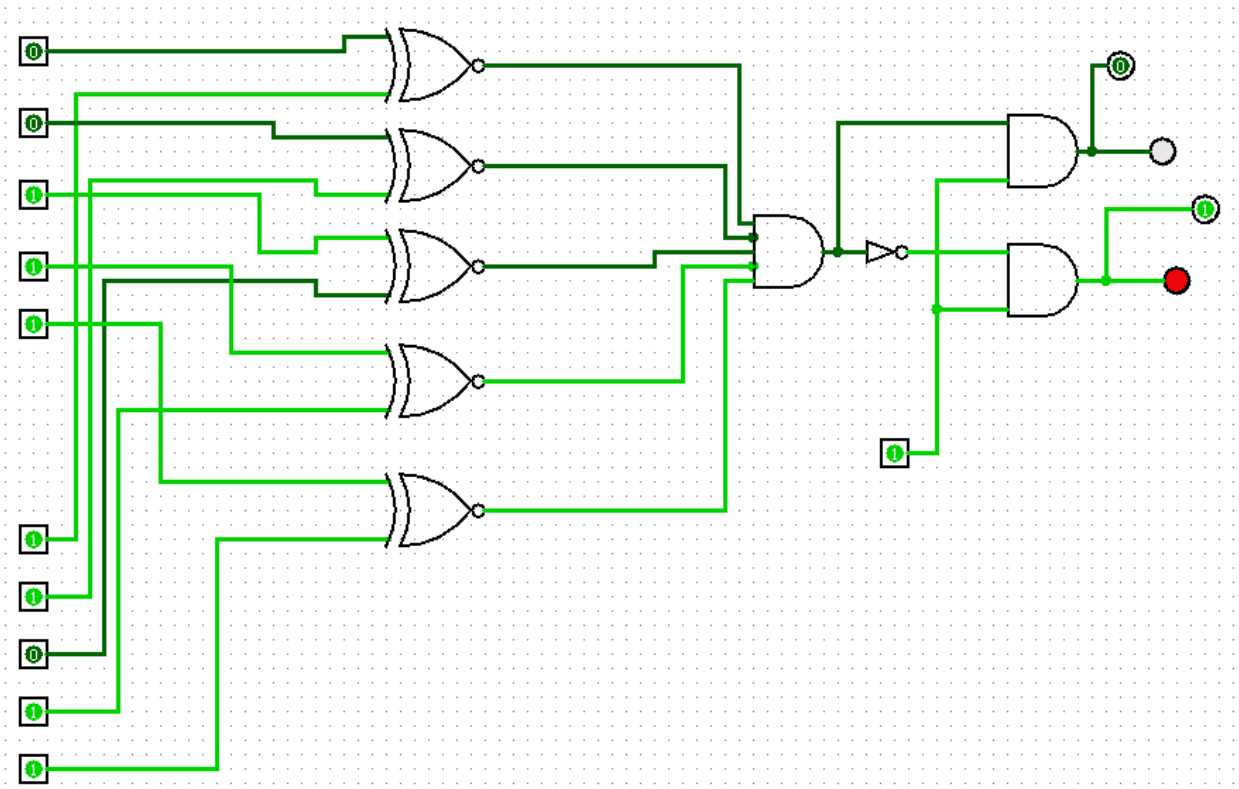
Lastly all outputs of AND gates will be connected to in AND gate to double check the values and give output of two other AND gates if it is satisfied then will unlock the system if not it will go to inverter to keep lock the system , both AND gates are .connected to constant which has role of switching the system

1.



As we see here the set numbers which are in the left down is same as the input number from the user that's why the green LED turn on and that's mean the door is open.

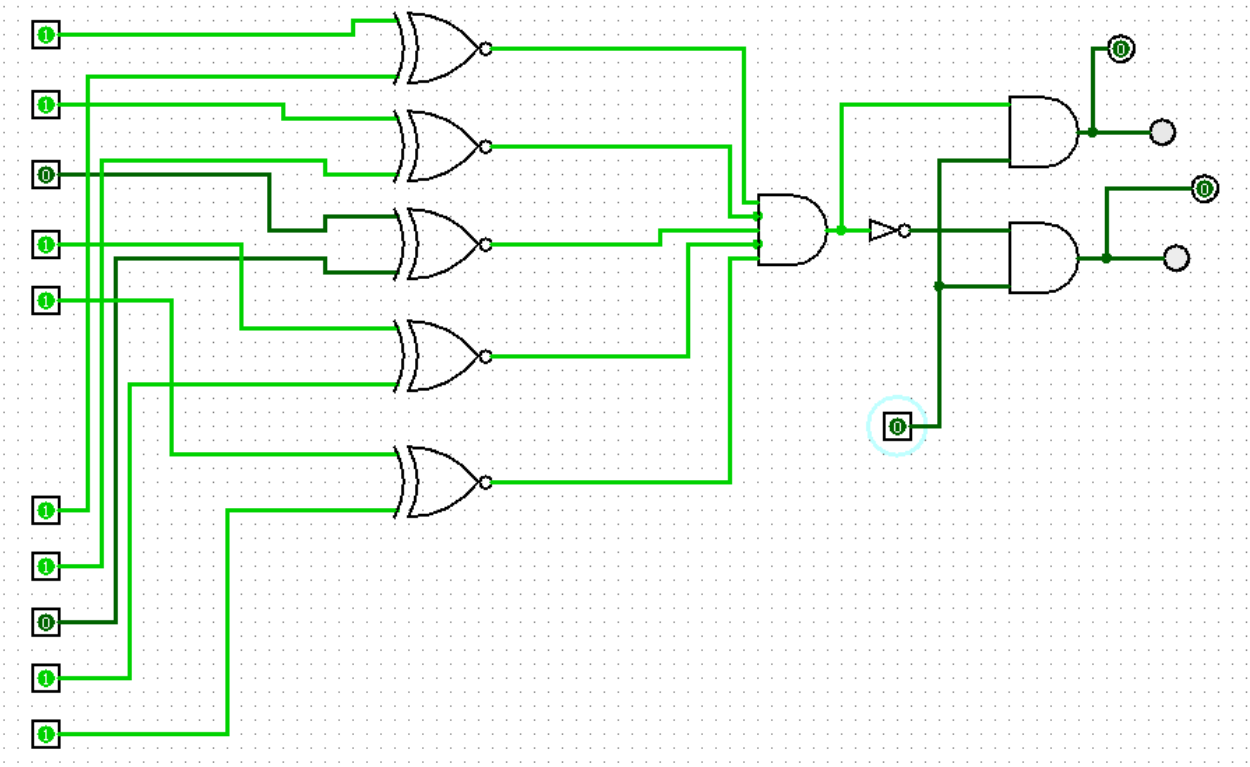
2.



And this is when the number that has been enter from the user not same as the number that has been set from the owner.

Detailed design

Circuit design



Truth table

a	b	c	d	e	f	g	h	x2	x3	x4	x	y
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	1	1	0	0
0	0	0	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	1	1	0	0	0
0	0	0	0	0	0	0	0	1	1	1	0	0
0	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0	1	0	0
0	0	0	0	0	0	0	1	0	1	0	0	0
0	0	0	0	0	0	0	1	0	1	1	0	0
0	0	0	0	0	0	0	1	1	0	0	0	0
0	0	0	0	0	0	0	1	1	0	1	0	0
0	0	0	0	0	0	0	1	1	1	0	0	0
0	0	0	0	0	0	0	1	1	1	1	0	0
0	0	0	0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	1	0	0	0	1	0	0
0	0	0	0	0	0	1	0	0	1	0	0	0
0	0	0	0	0	0	1	0	0	1	1	0	0
0	0	0	0	0	0	1	0	1	0	0	0	0
0	0	0	0	0	0	1	0	1	0	1	0	0
0	0	0	0	0	0	1	0	1	1	0	0	0
0	0	0	0	0	0	1	0	1	1	1	0	0
0	0	0	0	0	0	1	1	0	0	0	0	0
0	0	0	0	0	0	1	1	0	0	1	0	0
0	0	0	0	0	0	1	1	0	1	0	0	0
0	0	0	0	0	0	1	1	0	1	1	0	0
0	0	0	0	0	0	1	1	1	0	0	0	0
0	0	0	0	0	0	1	1	1	0	1	0	0
0	0	0	0	0	0	1	1	1	1	0	0	0
0	0	0	0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	1	0	0	0	1	0	0
0	0	0	0	0	0	1	0	0	1	0	0	0
0	0	0	0	0	0	1	0	0	1	1	0	0
0	0	0	0	0	0	1	0	1	0	0	0	0
0	0	0	0	0	0	1	0	1	0	1	0	0
0	0	0	0	0	0	1	0	1	1	0	0	0
0	0	0	0	0	0	1	0	1	1	1	0	0
0	0	0	0	0	0	1	1	0	0	0	0	0
0	0	0	0	0	0	1	1	0	0	1	0	0
0	0	0	0	0	0	1	1	0	1	0	0	0
0	0	0	0	0	0	1	1	0	1	1	0	0
0	0	0	0	0	0	1	1	1	0	0	0	0
0	0	0	0	0	0	1	1	1	0	1	0	0
0	0	0	0	0	0	1	1	1	1	0	0	0

0	0	0	0	0	0	1	1	1	0	1	0	0
0	0	0	0	0	0	1	1	1	1	0	0	0
0	0	0	0	0	0	1	1	1	1	1	0	0
0	0	0	0	0	1	0	0	0	0	0	1	0
0	0	0	0	0	1	0	0	0	0	1	0	1
0	0	0	0	0	1	0	0	0	1	0	0	1
0	0	0	0	0	1	0	0	0	1	1	0	1
0	0	0	0	0	1	0	0	1	0	0	0	1
0	0	0	0	0	1	0	0	1	0	1	0	1
0	0	0	0	0	1	0	0	1	1	0	0	1
0	0	0	0	0	1	0	0	1	1	1	0	1
0	0	0	0	0	1	0	1	0	0	0	0	1
0	0	0	0	0	1	0	1	0	0	1	0	1
0	0	0	0	0	1	0	1	0	1	0	0	1
0	0	0	0	0	1	0	1	0	1	1	0	1
0	0	0	0	0	1	0	1	1	0	0	0	1
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0	0	0	0	0	1	1	1	0	1	1	0	1
0	0	0	0	0	1	1	1	1	0	0	0	1
0	0	0	0	0	1	1	1	1	0	1	0	1
0	0	0	0	0	1	1	1	1	1	0	0	1

1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	0	0
1	0	0	0	0	0	0	0	0	1	0	0	0
1	0	0	0	0	0	0	0	0	1	1	0	0
1	0	0	0	0	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	0	1	0	1	0	0
1	0	0	0	0	0	0	0	1	1	0	0	0
1	0	0	0	0	0	0	0	1	1	1	0	0
1	0	0	0	0	0	0	1	0	0	0	0	0
1	0	0	0	0	0	0	1	0	0	1	0	0
1	0	0	0	0	0	0	1	0	1	0	0	0
1	0	0	0	0	0	0	1	0	1	1	0	0
1	0	0	0	0	0	0	1	1	0	0	0	0
1	0	0	0	0	0	0	1	1	0	1	0	0
1	0	0	0	0	0	0	1	1	1	0	0	0
1	0	0	0	0	0	0	1	1	1	1	0	0
1	0	0	0	0	0	1	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	1	0	0
1	0	0	0	0	0	1	0	0	1	0	0	0
1	0	0	0	0	0	1	0	0	1	1	0	0
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1	0	0	0	0	0	1	1	0	0	1	0	0
1	0	0	0	0	0	1	1	0	1	0	0	0
1	0	0	0	0	0	1	1	0	1	1	0	0
1	0	0	0	0	0	1	1	1	0	0	0	0
1	0	0	0	0	0	1	1	1	0	1	0	0
1	0	0	0	0	0	1	1	1	1	0	0	0
1	0	0	0	0	0	1	1	1	1	1	0	0

1	0	1	0	1	0	1	1	1	1	1	0	0
1	0	1	0	1	1	0	0	0	0	0	0	1
1	0	1	0	1	1	0	0	0	0	1	0	1
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1	0	1	0	1	1	0	0	0	1	1	0	1
1	0	1	0	1	1	0	0	1	0	0	0	1
1	0	1	0	1	1	0	0	1	0	1	0	1
1	0	1	0	1	1	0	0	1	1	0	0	1
1	0	1	0	1	1	0	0	1	1	1	0	1
1	0	1	0	1	1	0	1	0	0	0	0	1
1	0	1	0	1	1	0	1	0	0	1	0	1
1	0	1	0	1	1	0	1	0	1	0	0	1
1	0	1	0	1	1	0	1	0	1	1	0	1
1	0	1	0	1	1	0	1	1	0	0	0	1
1	0	1	0	1	1	0	1	1	0	1	0	1
1	0	1	0	1	1	0	1	1	1	0	0	1
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1	0	1	0	1	1	1	0	0	0	0	0	1
1	0	1	0	1	1	1	0	0	0	1	0	1
1	0	1	0	1	1	1	0	0	1	0	0	1
1	0	1	0	1	1	1	0	0	1	1	0	1
1	0	1	0	1	1	1	0	1	0	0	0	1
1	0	1	0	1	1	1	0	1	0	1	1	0
1	0	1	0	1	1	1	0	1	1	0	0	1
1	0	1	0	1	1	1	0	1	1	1	0	1
1	0	1	0	1	1	1	1	0	0	0	0	1
1	0	1	0	1	1	1	1	0	0	1	0	1
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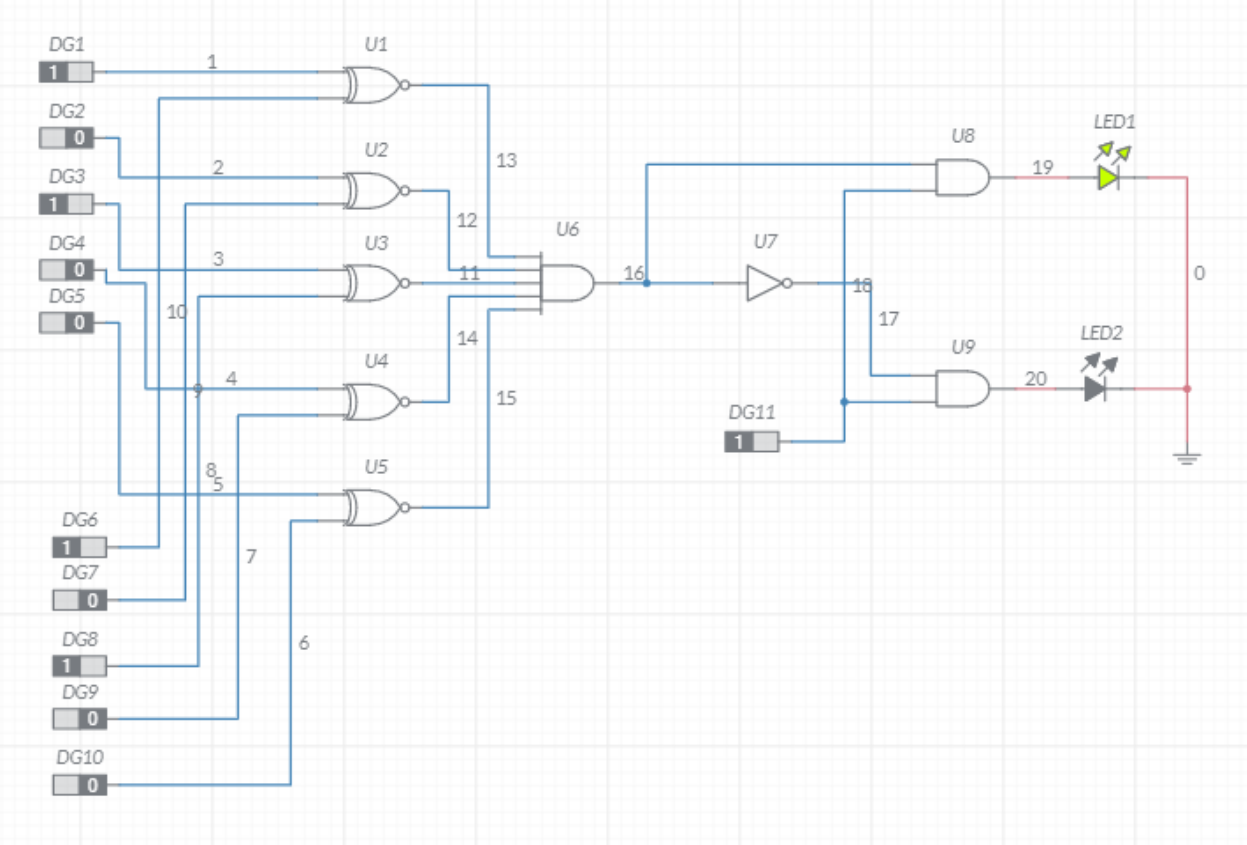
1	0	1	0	1	1	1	1	1	0	0	0	1
1	0	1	0	1	1	1	1	1	0	1	0	1
1	0	1	0	1	1	1	1	1	1	0	0	1

Since we have 10 input which is 5 sitting number and 5 input number from the user that is why we have a very long table and this is some of the truth table because we have about 1024 properties so, it is difficult to put it here.

Design verification

Multisim verification :



So, after

Conclusion

A Security lock system using Pass-codes has been designed, analyzed and implemented. Its advantages cannot be over-emphasized in these modern days of technological breakthroughs. The addition of a PC interface enables flexibility in terms of manipulating the different combinations of pass codes. Security lock system using Pass-codes would be found very useful in applications which require strong security protection and authentication such as: Banks, Industrial Facilities, Commercial Buildings, Airports, Museums and Fine Art, Warehouses etc.