

EE231 Project Smart Home Control System



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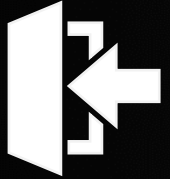
Dr. Ahmed Mechraoui

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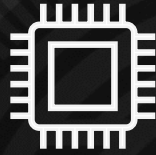




Our Content



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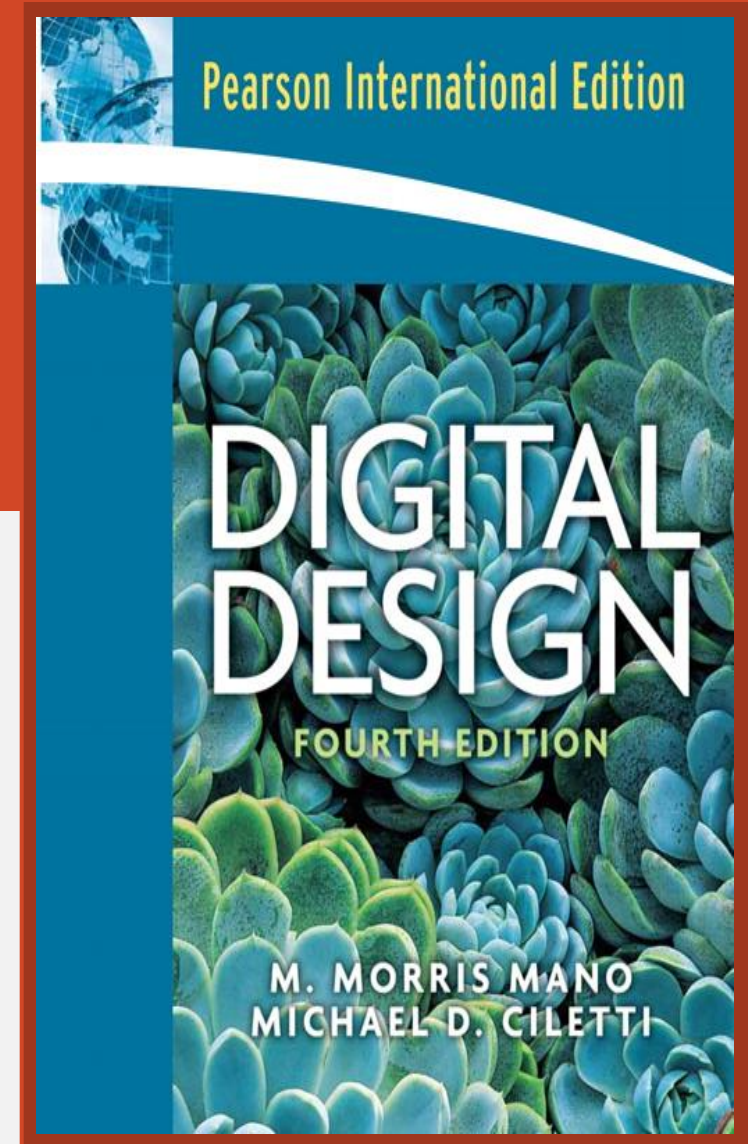
Development Suggestions



Conclusion

Introduction

- In this project we wanted to create a smart home control system that is easy to use and set-up.
- Using the knowledge we gained throughout this course, we were able to make this simple system with logic gates.





Theory

We have three inputs:

- 1- Door button (Lock).
- 2- Time.
- 3- Temperature.



Four outputs were chosen:

- 1- Lights.
- 2- AC.
- 3- Curtains.
- 4- Coffee maker.



Truth Tables & K-maps

Inputs			Outputs			
Door Button	Time	Temp	Lights	AC	Curtains	Coffee Maker
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	1	0	0	0	0	0
0	1	1	0	0	0	0
1	0	0	1	0	0	0
1	0	1	1	1	0	0
1	1	0	0	0	1	1
1	1	1	0	1	1	1

Door Button = X, Time = Y		
Lights (K-map)		
X\Y	0	1
0	0	0
1	1	0
Lights = XY'		

Door Button = X, Time = Y		
Curtains (K-map)		
X\Y	0	1
0	0	0
1	0	1
Curtains = XY		

Door Button = X, Time = Y, Temperature = Z				
AC (K-map)				
X\YZ	00	01	11	10
0	0	0	0	0
1	0	1	1	0
AC = XZ				

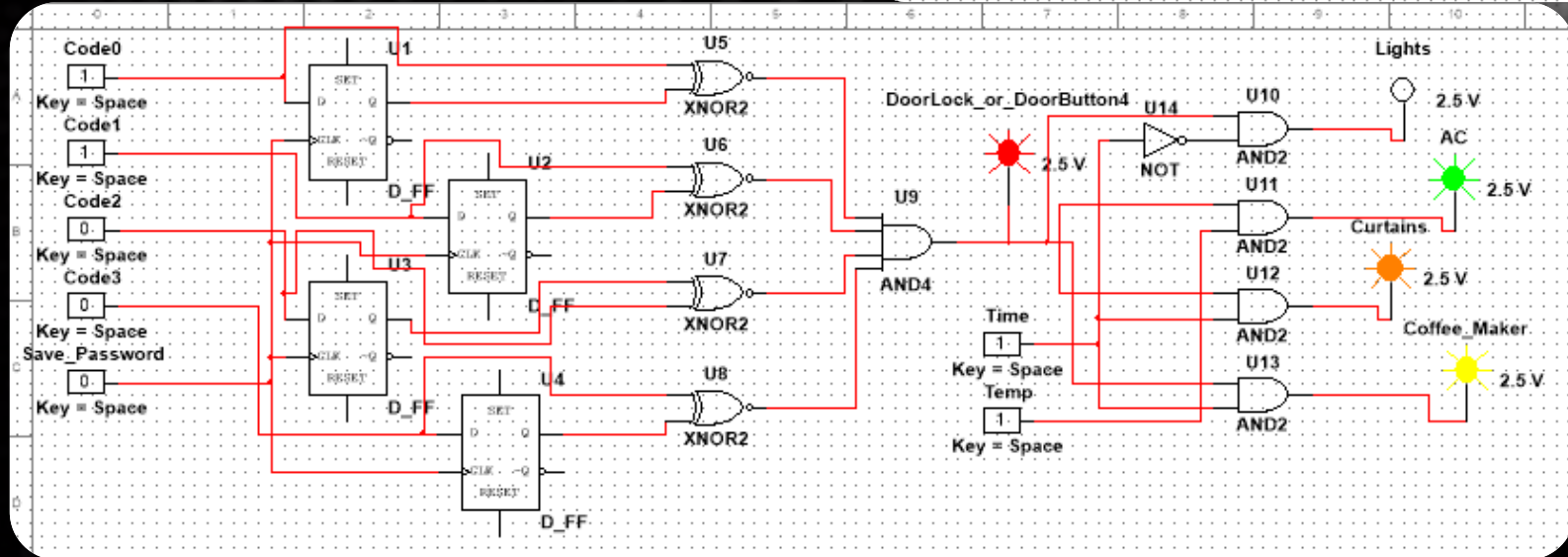
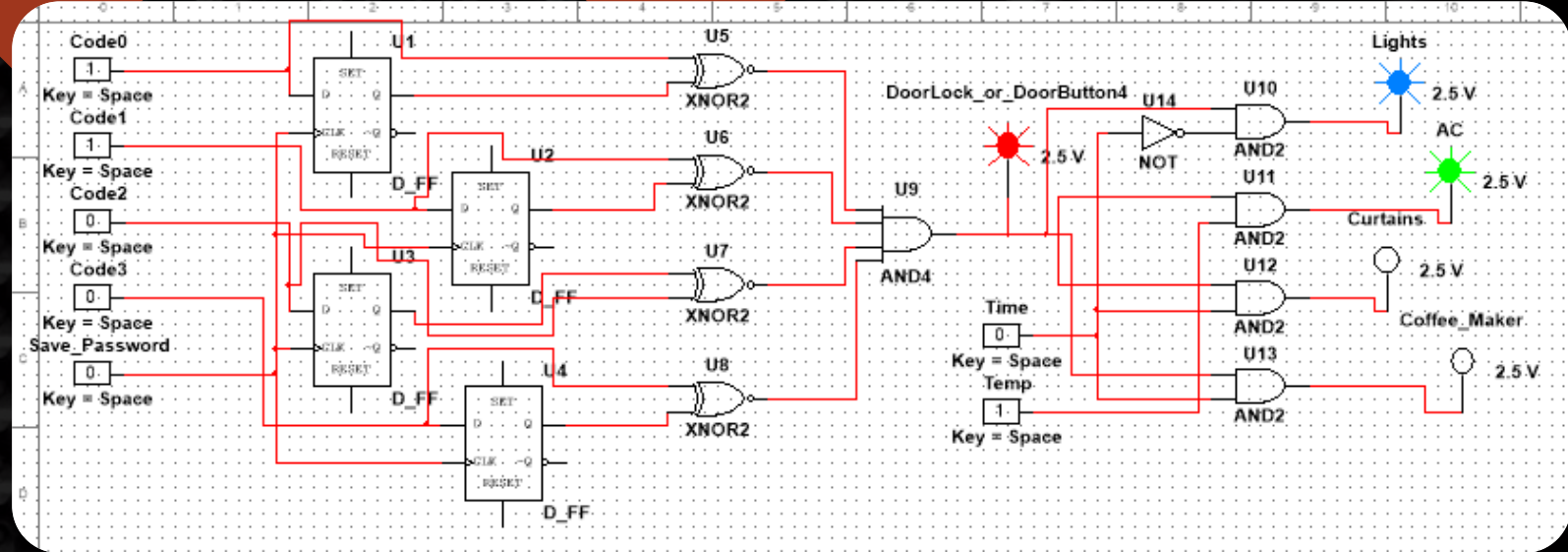
Door Button = X, Time = Y		
Coffee Maker (K-map)		
X\Y	0	1
0	0	0
1	0	1
Coffee Maker = XY		

The Function Table of the Door Lock

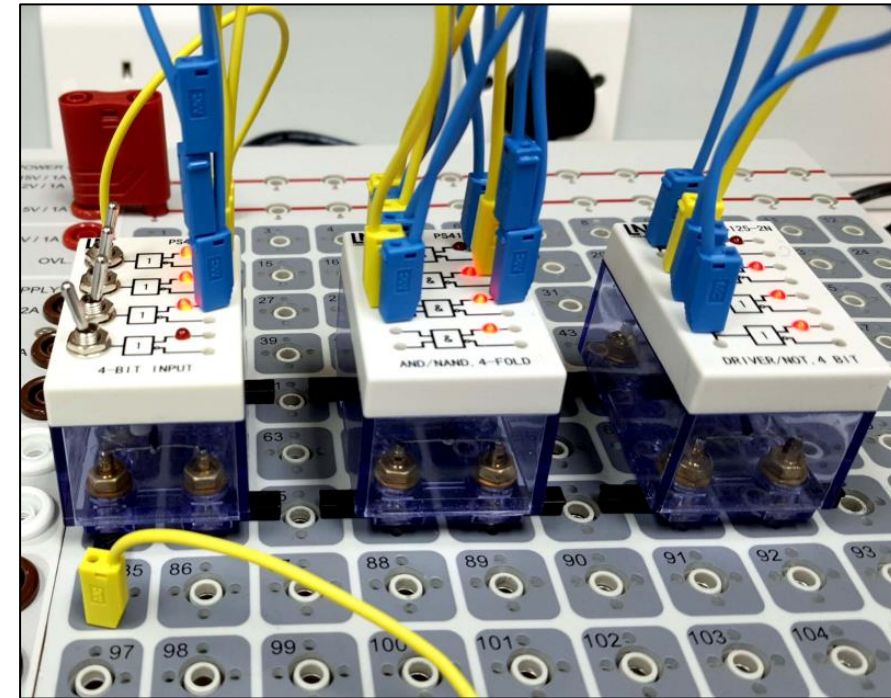
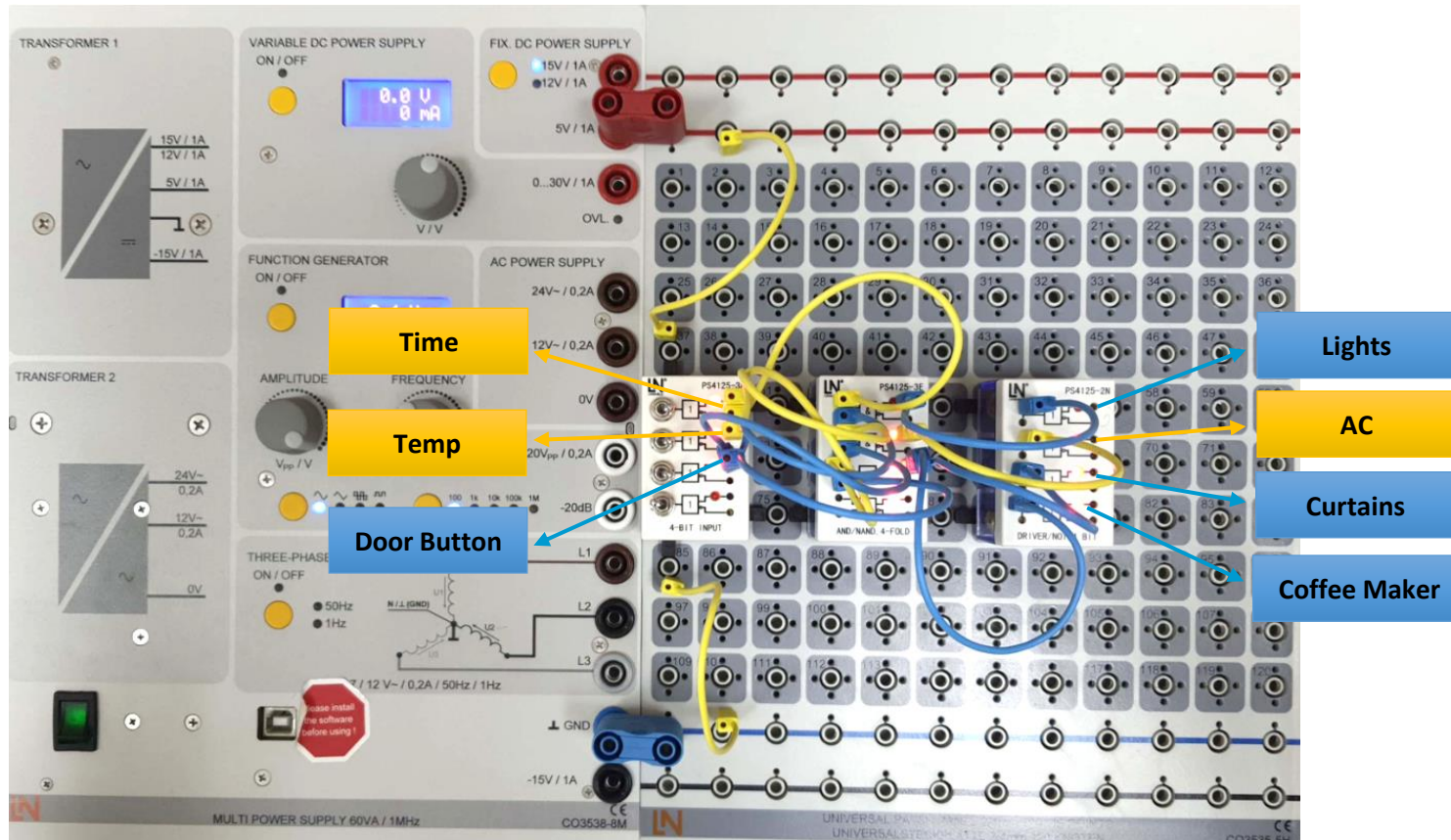
Save	Code0 to Code4 (any combination)	Door Button
0	X	0
1	A specific combination	1
0 or 1	The same combination	1
0 or 1	A different combination	0

The logical expression for The door Lock: **Door Button** = $(C0 \oplus Q1)' * (C1 \oplus Q2)' * (C2 \oplus Q3)' * (C3 \oplus Q4)'$

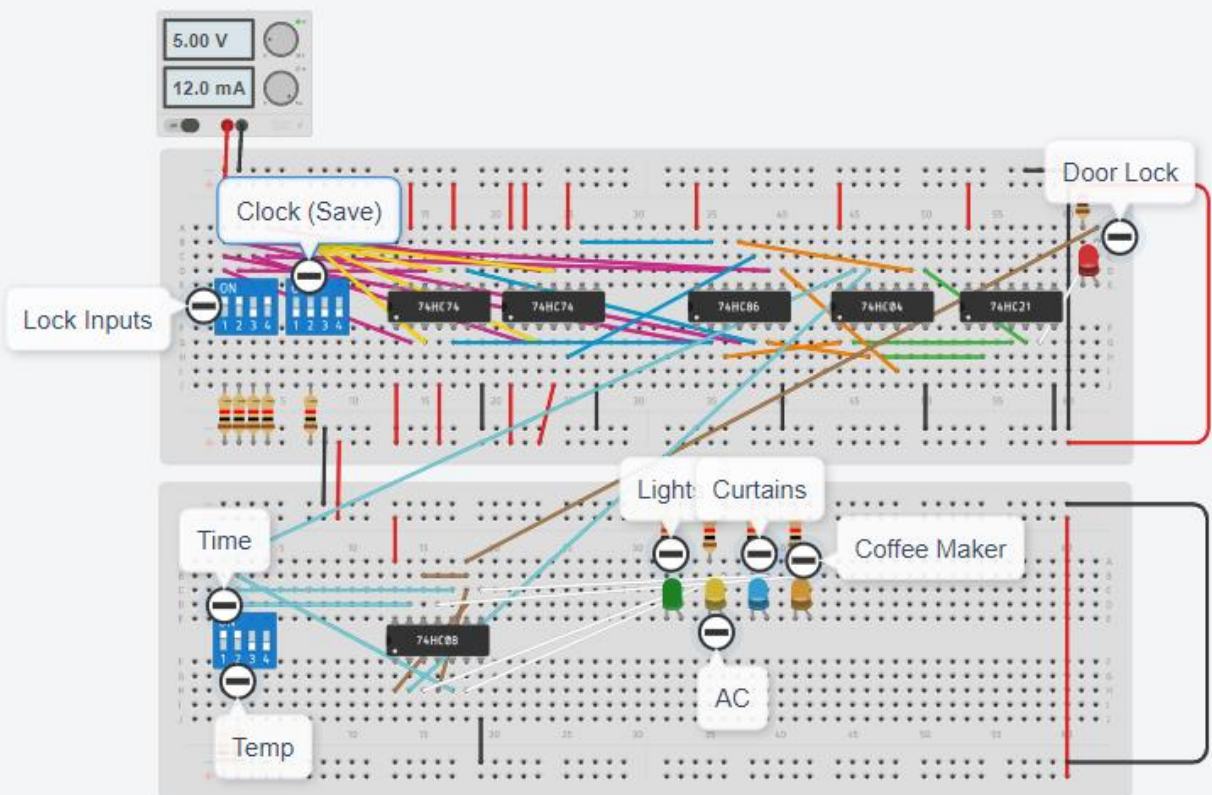
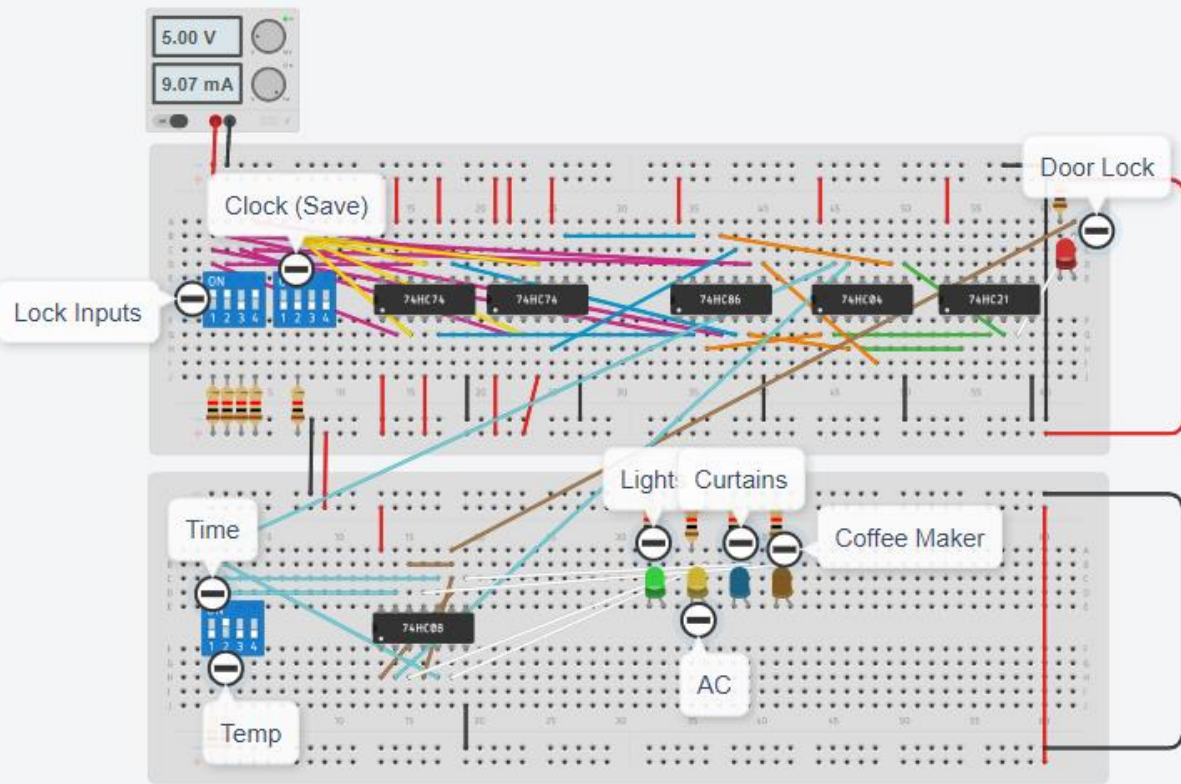
Multisim Simulation



Hardwired Components



Tinkercad Simulation



Development Suggestions

1- Replace the Time input with a timer.



2- Add extra outputs.



3- Include more inputs.



Conclusion

- The implementation of our EE231 course.
- The future improvement.



THE END

Thank You!



Any Questions?

