Title: *Password Security System*

I. Objective

For this project, individuals will implement a password security system. The "Password Security System" project will give individuals the opportunity to become familiar with using NOR and XOR logic gates within a circuit.

II. Summary

For this project, NOR and XOR gates, switches, LEDs, and resistors are used within this project. The "key code" and "data entry" switches are the two eight 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 password has been attempted.

III. Related to Industry

The use of logic gates is critical to industries worldwide. In today's world, copious individuals' input password into his/her security system to secure or to unsecure his/her home and/or business. A company like Ring provides a great number of homes with security systems so that individuals can protect his/her property. For example, individuals can receive alerts and video footage when someone is new his/her home. Individuals can also check the Ring app at all times to make sure there is not anything going on in or outside of his/her property. Above it all, a company like

Ring is great with providing security systems to people's homes thanks to the use of logic gates within each security system.

IV. Project Description

The equipment used in this project will be a 4001 quad NOR gate, 4070 quad XOR gate, two eight position DIP switches, two light-emitting diodes, four 1N914 "switching" diodes, ten 10kΩ resistors, two 470Ω resistors, a pushbutton switch (normally open), power supply, breadboard, and wires.

V. Procedure

a. Set the power supply to 9 volts, and place voltage and ground to the breadboard.

b. Connect voltage to each "key code" switch and each "data entry switch."

c. Connect a "key code" switch to pins 1, 4, 10, and 13 of the XOR gate, as well as, connect a "data entry switch" to pins 2, 5, 9, and 12 of the XOR gate.

d. Connect a 10kΩ resistors to each "key code" switch, as well as, to each "data entry" switch.

e. Place a wire from each resistor to ground.

f. Allow a wire to come from pin 3, pin 6, pin 8, and pin 11 the XOR gate to pins 1, 3, 5, and 9 of the 1N914 "switching" diode.

g. Place a wire from pins 2, 4, 6, and 8 of the 1N914 "switching" diode to a 10kΩ resistor.

h. Place a wire from the 10kΩ resistors to ground.

i. Connect the pin 2 of the 1N914 "switching" diode to pin 1 of the NOR gate, as well as, a 10kΩ resistors connected to pin 2 of the 4001 quad.

j. Place a wire from pin 3 of the 4001 quad to pin 4 of the 4001 quad and place a wire from pin 5 to the pushbutton switch.

k. Connect the pushbutton switch to ground.

l. Place a wire from pin 6 to a light-emitting diode.

m. Place a wire from pin 3 of the 1N914 “switching” diode to pin 10 of the 4001 quad, as well as, a wire from pin 9 of the 4001 quad to a 10kΩ resistor.

n. Connect the 10kΩ resistor to voltage.

o. Place a wire from pin 8 of the 4001 quad to a light-emitting diode.

p. Place a 470Ω resistor to each light-emitting diode.

q. Connect each 470Ω resistor to ground.

VI. Photo and Reference

a. https://www.youtube.com/watch?v=L0uFPePqGi8&t=54s