Bahria University Islamabad

Password Security System using Logic Gates

PROJECT SUBMISSION

Group Members

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Subject Information

Subject	Digital Logic Design Lab
Instructor	Ali Muhammad
Semester	Spring 2022
Class	BS(IT) 2nd Semester
Section	A
Organization	Bahria University Islamabad

Project Information

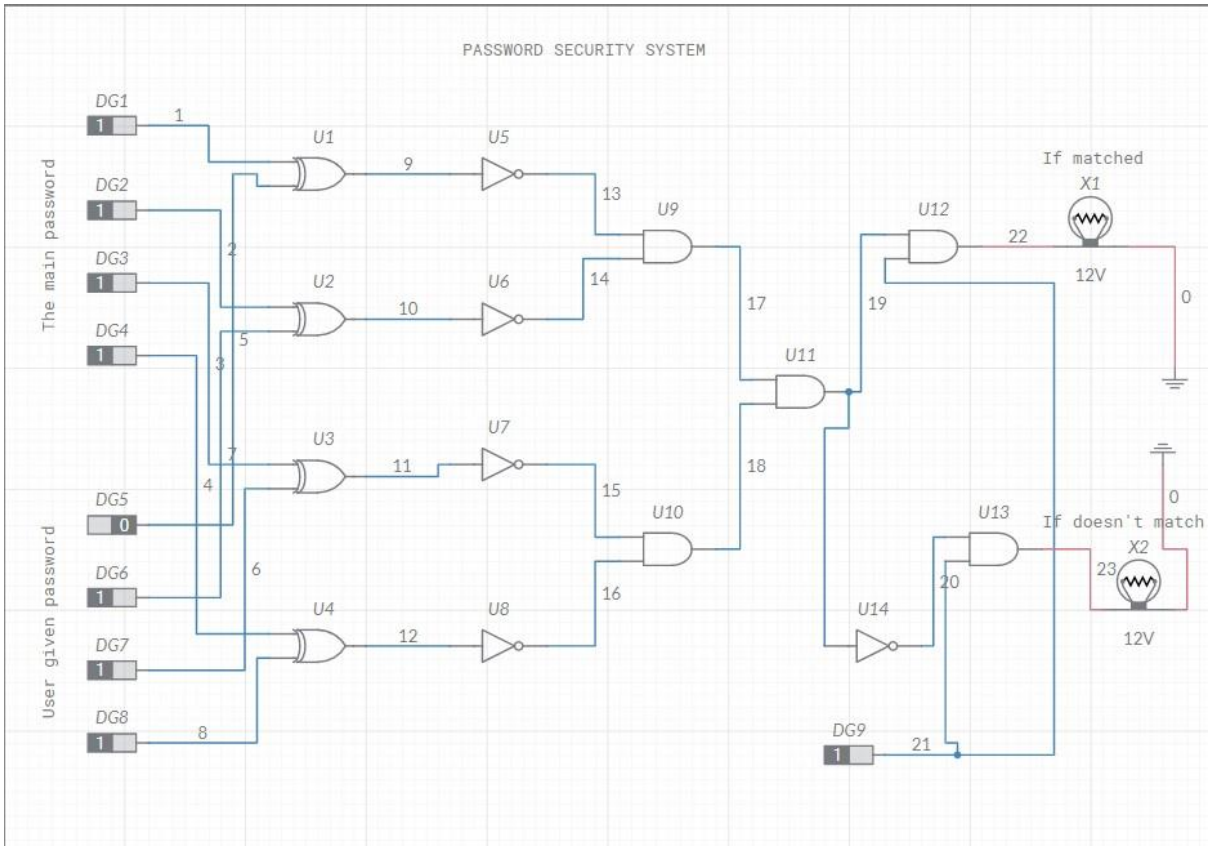
Title	Password Security System
Document	Submission Report
Submission Date	09th January 2023
Timeline	30 days (4 weeks)

Project Description

1. Objective:

- Using XOR gates as bit comparators
- How to build simple gate functions with diodes and a pull-up/down resistor
- Using NOR gates as controlled inverter

2. Circuit Diagram:



3. Components:

Breadboard:

The breadboard has many tiny sockets or holes arranged on a 0.1'' grid. The leads or terminals of most of the components like resistors, diodes, transistors, etc. can be pushed straight into the holes. The breadboard has 4 rows of holes at the top and 4 rows at the bottom and there are several holes in the column. A breadboard is a device for testing temporary electronics projects. Components used to test a circuit can be reused for other projects. None of the components are damaged.

4001 quad NOR gate:

The NOR gate is a digital logic gate that implements logical NOR. NOR is the result of the negation of the OR operator. It can also be seen as an AND gate with all the inputs inverted. NOR is a functionally complete operation—NOR gates can be combined to generate any other logical function. It shares this property with the NAND gate. By contrast, the OR operator is monotonic as it can only change LOW to HIGH but not vice versa.

4070 quad XOR gate:

The XOR gate (sometimes EOR gate, or EXOR gate and pronounced as Exclusive OR gate) is a digital logic gate that gives a true (1 or HIGH) output when the number of true inputs is odd. An XOR gate implements an exclusive or; that is, true output results if one, and only one, of the inputs to the gate is true. If both inputs are false (0/LOW) and both are true false output results. XOR represents the inequality function, i.e., the output is true if the inputs are not alike otherwise `the output is false. A way to remember XOR is "one or the other but not both".

Two, eight-position DIP switches:

A DIP switch is a manual electric switch that is packaged with others in a group in a standard dual in-line package (DIP). The term may refer to each switch or the unit as a whole. This type of switch is designed to be used on a printed circuit board along with other electronic components and is commonly used to customize the behavior of an electronic device for specific situations.

Resistors 10k (*10),470 Ω(*2):

A resistor is an electrical component that limits or regulates the flow of electrical current in an electronic circuit. Resistors can also be used to provide a specific voltage for an active device such as a transistor.

Two 9v Battery:

A battery is an electrochemical cell (or enclosed and protected material) that can be charged electrically to provide a static potential for power or released electrical charge when needed.

Push button:

A push-button or simply button is a simple switch mechanism for controlling some aspect of a machine or a process.

Four 1N914 “switching” diodes:

A switching diode provides the same functionality as a switch. It has high resistance below the specified applied voltage similar to an open switch, whereas above that voltage it changes in a sudden way to the low resistance of a closed switch. Switching diodes are used in devices such as ring modulation.

Two light-emitting diodes:

A semiconductor diode emits light when conducting current and is used in electronic equipment.

4. Working Principle:

The four XOR gates' output terminals are connected through a diode network which functions as a four-input OR gate: if any of the four XOR gates outputs a "high" signal—indicating that the entered code and the key code are not identical—then a "high" signal will be passed on to the NOR gate logic.

If the two 4-bit codes are identical, then none of the XOR gate outputs will be "high," and the pull-down resistor connected to the common sides of the diodes will provide a "low" signal state to the NOR logic.