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PASSWORD BASED DOOR LOCK SYSTEM USING ARDUINO

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Abstract— The need of safety can be achieved by making locks which can be electrical or mechanical with one or a few keys, but for locking a big area many locks are required. As everyone knows old fashioned locks are heavy weight and fragile also depending on the tools therefore electronic locks are given more value than those of mechanical locks. Nowadays every device's operation is based on digital technology. For example, technology based identity devices are used for automatic door unlocking or locking. These locking systems are used to control the movement of door and are functional without requiring a key to lock or unlock the door. These locking systems are controlled by a keypad and are installed at the side hedge of the door. The main objective of this project is to give safety at every common places like home, public places. In this user would give a known password. The information will be stored in database. When the correct passcode will be entered, the microcontroller will give instruction to servo motor. Servo motor will perform the action on door unlocking. Thus, what we want is digital technology to construct an integrated and well customized safety system at a price which is reasonable.

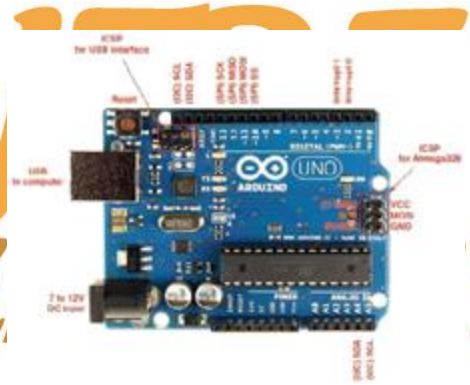
1. INTRODUCTION

Password Based Door Lock System is designed using ARDUINO UNO where in once the correct code or password is entered, the door is opened and the concerned person is allowed access to the secured area. Password Based Door Lock System using Arduino UNO is a simple project where a secure password will act as a door unlocking system. Old fashioned lock systems use mechanical locking and these can be replaced by new advanced techniques of locking systems. These methods are a combination of mechanical and electronic devices and are highly intelligent. One of the distinct features of these intelligent lock systems is their simplicity and high efficiency. Such an automated lock system consists of electronic control assembly, which controls the output load through a password. The example of this output load can be a motor or a lamp or any other mechanical/electrical load Here, we made an electronic code lock system using Arduino UNO, which provides control to the actuating the load. It is a simple embedded system with takes input from the keyboard and the output being actuated accordingly. This systemdemonstrates a Password based Door Lock System using Arduino UNO, wherein once the correct code or password is entered, the door is opened and the concerned person is allowed access to the secured area. If another person arrives, it will ask to enter the password again. If the password is wrong, then door would remain locked, denying access to the person.

2. MATERIALS

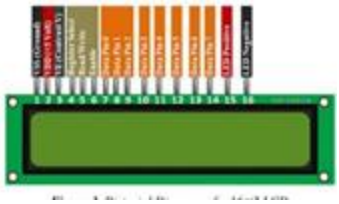
2.1 Arduino Uno

This microcontroller is based on the ATmega328P. There are total of 20 pins (0- 19) out of which 6 are analog inputs, 14 are digital input output pins(6 pins provide PWM voltage) which can also be used as general purpose pins, a ceramic resonator of frequency 16 MHz, an USB connection, a power jack and a reset button. It has an operating voltage of 5V. It contains everything needed to support a microcontroller.



2.2 LCD

Liquid Crystal Display (LCD) A liquid crystal display (LCD) is a flat-panel display that uses the light-modulating properties of liquid crystals combined with polarizers to display information on a screen that become visible when electricity is passed it. A 16×2 LCD will be used in this work. This is programmed using the library



2.3 Buzzer

A buzzer or beeper is an audio signaling

device, which may mechanical, electromechanical, or piezoelectric.

2.4 Membrane Keypad

In our project we will be using 4X4 matrix membrane keypad. This 16 button keypad will provide user interface component for Arduino project. This is programmed using the library

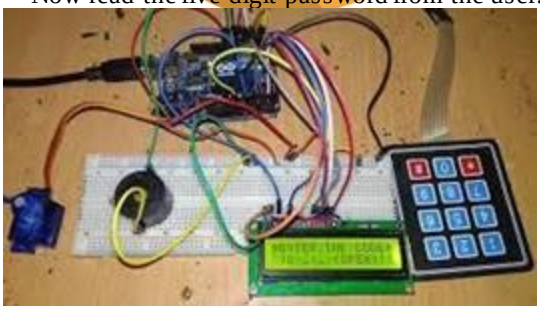
2.5 Potentiometer

In our project we have used a potentiometer of 10Kohm resistance in order to adjust the contrast of the Liquid crystal display.

3. Password Based Door Lock System Algorithm:

Initially, declare the PORT1 to LCD data pins and control pins (RS and E) to P3.0 and P3.2. Also, declare PORT2 to keypad. Also use P0.0 and P0.1 for motor driver.

1. Then, display the message "enter password" on LCD.
2. Now read the five digit password from the user.



3. Compare the entered password with the stored password.
4. If password is correct, then make P0.0 pin HIGH and P0.1 pin LOW to open the door. During this time, display "Door opening" on LCD.
5. After some time, make P0.0 pin LOW and P0.1 pin HIGH to close the door and after this display "Door closing" on LCD.
6. If the password is wrong, then display "Wrong Password" on LCD.
7. After some delay again ask to enter password.
8. After some delay again ask to enter password Password based door lock system

Advantages of Password Based Door Lock System

- This project provides security
- Power consumption is less
- Used commonly available components
- Project is simple and easy

Applications of password Door lock system

- This simple circuit can be used at residential places to ensure better safety.
- It can be used at organizations to ensure authorized access to highly secured places.
- With a slight modification this Project can be used to control the switching of loads through password.

4. RESULT AND SIMULATION

- When it is entered a 4 digit password by the user it will display on LCD as ****.Therefore anyone else can't see what the user enters
- If it is the correct password, LCD displaying a message —Well come and the door will be opened. After

10 seconds time door is locked automatically.

- If he is entered password incorrectly LCD displaying —wrong password.

5. CONCLUSION

Considering the need for security consciousness, a password based door lock security system was constructed using Arduino. The system serves to mitigate the increasing rate of crime, attacks by thieves and intruders. With this system, the burden of carrying large numbers of keys is eliminated. This work stands not to be the best that can be realized as several modifications and improvements can be incorporated into the design, these include:

1. Incorporating a PC interface to monitor and control activities at the door unit in real time through a logging system;
2. Incorporating a motion sensor to automatically sense presence at the door unit and prompt for password; and
3. Provision for rechargeable back-up batteries in case of power failure from the mains supply

FUTURE SCOPE

- We can send this data to a remote location using mobile or internet.
- We can add fingerprint sensor so entry will be allowed for the authorized person using their fingerprints.
- We can add fire, wind and LPG sensors so that, the doors will automatically open.

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