VIT-AP UNIVERSITY

VELLORE INSTITUTE OF TECHNOLOGY, AP AMRAVATI

PROJECT ON

HOME AUTOMATION AND SECURITY

By

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ABSTRACT:

The main objective of this project is to develop a home automation system using an Arduino board with Bluetooth being remotely controlled by any Android OS smartphone. As technology is advancing so houses are also getting smarter.

Modern houses are gradually shifting from conventional switches to centralized control systems, involving remote controlled switches. Presently, conventional wall switches located in different parts of the house makes it difficult for the user to

go near them to operate. Even more, it becomes more difficult for the elderly or physically handicapped people to do so.

In order to achieve this , a Bluetooth module is interfaced to the Arduino board at the receiver end while on the transmitter end, a GUI application on the cell phone sends ON/OFF commands to the receiver where loads are connected. By touching the specified location on the GUI, the load s can be turned ON/OFF remotely through this technology.

INTRODUCTION:

Nowadays, we have remote controls for our television sets and other electronic systems, which have made our lives real easy. Have you ever wondered about home automation which would give the facility of controlling LED lights, fans and other electrical appliances at home using a remote control? Off-course , Yes! But, are the available options cost-effective? If the answer is No, we have found a solution to it. We have come up with a new system called Arduino based home automation using Bluetooth. This system is super-cost effective and can give the user the ability to control any electronic device without even spending for a remote control. This project t he helps the user to control all the electronic devices using his/her smart device

Time is a very valuable thing. Everybody wants to save time as much as they can. New technologies are being introduced to save our time. To save people's time we are introducing a Home Automation system using Bluetooth . With the help of this system you can control your home appliances from your mobile phone. You can turn on/off your home appliances within the range of Bluetooth.

BACKGROUND:

This project revolves around the home automation of heat and light and to give it an efficient way of functioning and a better security for it.

The project uses a sensory based system for detecting the presence of an object and then it enables the user to use the amenities and as well as verify the user and provide security.

Home automation may cost for the installation but the overall advantage of power consumption reduces the cost as well as efficiency.

PROBLEM DEFINITION:

1) High power consumption
2) Operating device radius
3) Home Security problem

OBJECTIVES:

The objective of this project is to implement a low cost , reliable and scalable home automation system that can be used to remotely switch on or off any household appliance , using a microcontroller to achieve hardware simplicity ,low cost short messaging service for feedback and voice dial from any phone to toggle the switch state.

Automation

Automation is, unsurprisingly, one of the two main characteristics of home automation. Automation refers to the ability to program and schedule events for the devices on the network.

The programming may include time-related commands, such as having your lights turn on or off at specific times each day. It can also include non-scheduled events, such as turning on all the lights in your home when your security system alarm is triggered.
Once you start to understand the possibilities of home automation scheduling, you can come up with any number of useful and creative solutions to make your life better.

Is that west-facing window letting in too much light? Plug your motorized blinds into a smart outlet and program it to close at noon each day.

Do you have someone come by at the same time each day to walk the dog? Program your home automation system to unlock the front door for them, and lock it up again when they're done.

Home automation components

What kinds of things can be part of a home automation system? Ideally, anything that can be connected to a network can be automated and controlled remotely. In the real world (outside of research labs and the homes of the rich and famous), home automation most commonly connects simple binary devices.

This includes "on and off" devices such as lights, power outlets and electronic locks, but also devices such as security sensors which have only two states, open and closed.

Where home automation becomes truly smart is in the Internet-enabled devices that attach to this network and control it. The classic control unit is the home computer, for which many of the earlier home automation systems were designed.

Today's home automation systems are more likely to distribute programming and monitoring control between a dedicated device in the home, like the control panel of a security system, and a user-friendly app interface that can be accessed via an

Internet-enabled PC, smartphone or tablet.

Manufacturers have produced a wide variety of smart devices, many of which are full of innovative features but few of which offer the kind of integration needed to be part of a complete home automation system. Much of the problem has been that each manufacturer has a different idea of how these devices should be connected and controlled.

So while you may have a smart TV, washing machine, refrigerator, thermostat, coffee maker or any of the other Internet-ready household devices on the market, the end result is usually a separate control scheme for each device.

In the near future, home automation may be standardized to let us truly take advantage of all of these additional possibilities. For the time being, the home security providers that specialize in home automation have focused on the most critical and useful parts of a connected home.

At a basic level, this means the doors and windows and environmental devices (thermostat, smoke detectors, temperature, humidity, fire and carbon dioxide sensors) that keep you safe and comfortable.

For additional real-time security, convenience and control, home automation systems from security providers should also include options for video cameras. With the best systems, you'll also be able to include lights and individual electrical outlets into your home automation package.

Energy efficiency

One clear advantage of home automation is the unmatched potential for energy savings, and therefore cost savings. Your thermostat is already smart in the sense that it uses a temperature threshold to govern the home’s heating and cooling system.

In most cases, thermostats can also be programmed with different target temperatures in order to keep energy usage at a minimum during the hours when you’re least likely to benefit from the heating and cooling.

At the most basic level, home automation extends that scheduled programmability to lighting, so that you can suit your energy usage to your usual daily schedule. With more flexible home automation systems, electrical outlets or even individual devices can also be automatically powered down during hours of the day when they’re not needed.

As with isolated devices like thermostats and sprinkler systems, the scheduling can be further broken down to distinguish between weekends and even seasons of the year, in some cases.

Set schedules are helpful, but many of us keep different hours from day to day. Energy costs can be even further reduced by programming "routines" into the system and controlling it remotely whenever needed.

In other words, you could set up a "coming home" event that turns on lights and heating as you’re driving home after work, for example, and activate it all with one tap on your smartphone.

An opposite "leaving home" event could save you from wasting energy on forgotten lights and appliances once you’ve left for the day.

PROCEDURE:

The procedure of the functioning of the project is very simple.

Step 1:When someone enters the home a password is asked

Step 2: When the password is correct the lights are automatically switched on and based on the number of sensors it can also be used to turn it off while exiting the room.

Step 3: when the temperature is greater the the threshold temperature the fan is turned on to cool the room

Step 4: when exiting the password is asked and the light and fan are all turned off

RESULTS:

1.Sensory working lights and fan

2.Keypad based security system

CONCLUSION:

SIMULATED HOME AUTOMATION will control devices (simulated) connected to the home PC from a remote location via the internet. It permits you to access home appliances (simulated) within your home pc without compromising security. It pays utmost importance
to security, therefore does not provide direct access from a public network. Rather it accesses your home pc files through a public mailing system. We use GMail SMTP/POP3/IMAP servers to achieve these feats.
Simulated home automation therefore is a faster, secure, economic way to remotely control your electronic gadgets at home through your home pc from any part of the world.

FUTURE SCOPE:

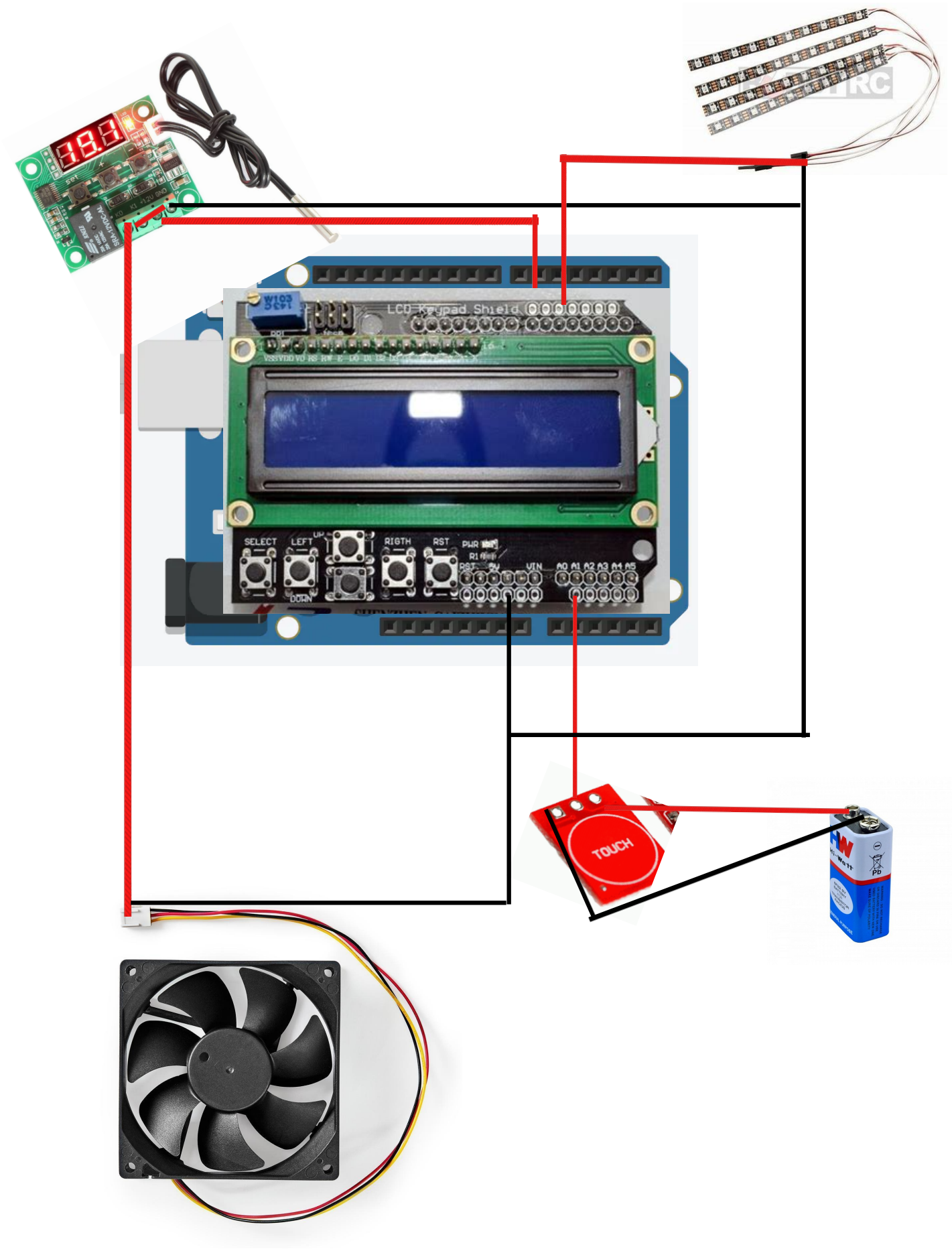
1.The embedded device can be made in such a way that it should alert the user in case of power loss or device failure.
2.The whole system can be implemented using wireless technology.
3.The embedded device can be made as a remote controlling the electronic gadgets.

REFERENCES:

1.Arduino.in

2.Youtube reference

CIRCUIT:



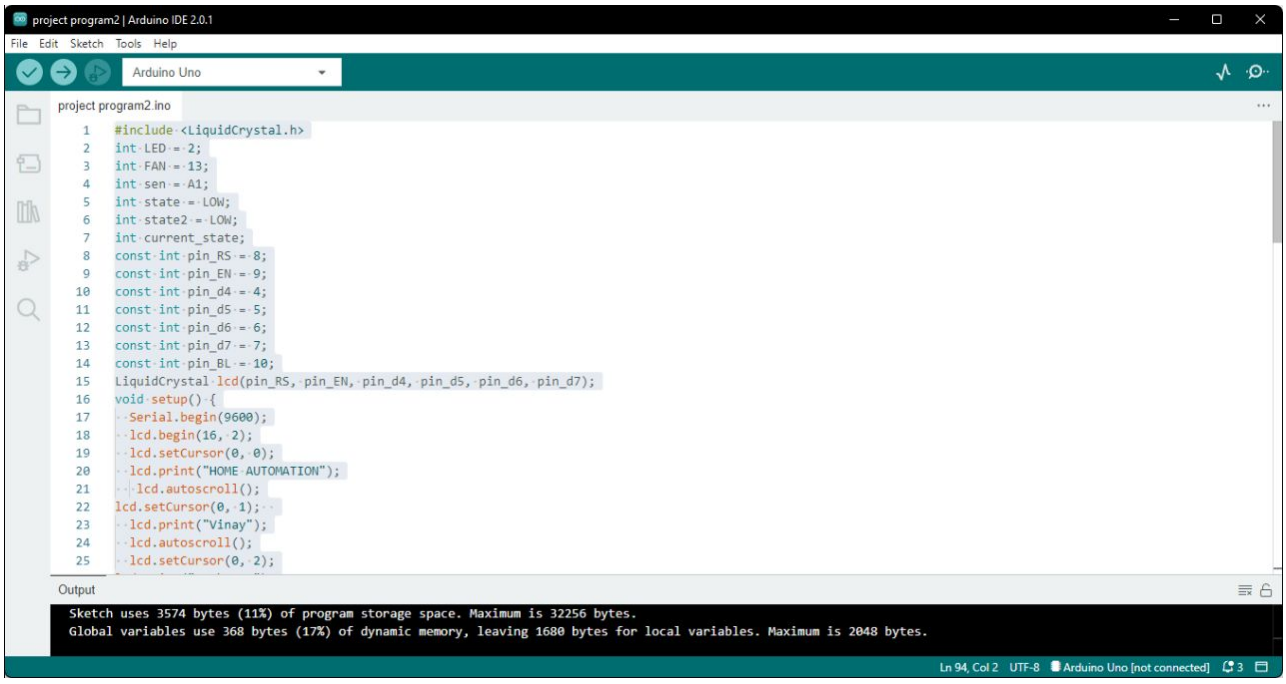
CODES IN APPENDIX:

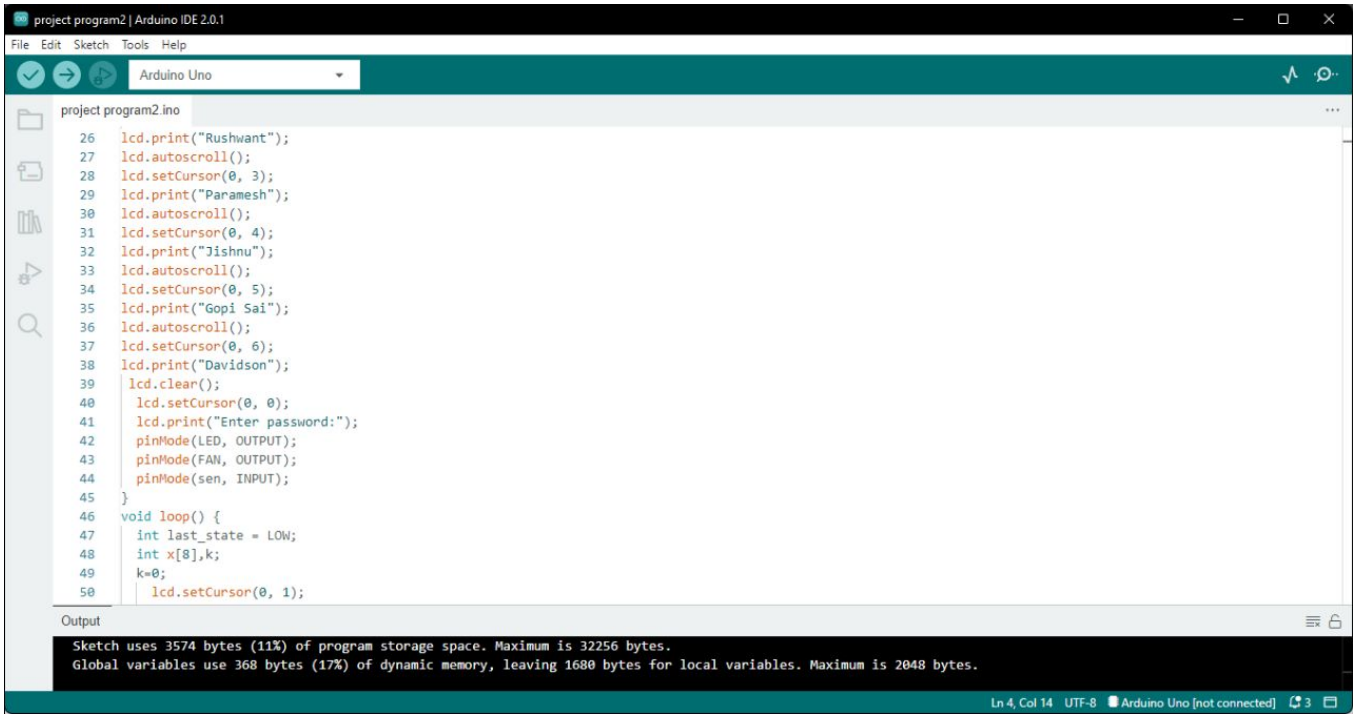
```
#include <LiquidCrystal.h>
int LED = 2;
int FAN = 13;
int sen = A1;
int state = LOW;
int state2 = LOW;
int current_state;
const int pin_RS = 8;
const int pin_EN = 9;
const int pin_d4 = 4;
const int pin_d5 = 5;
const int pin_d6 = 6;
const int pin_d7 = 7;
const int pin_BL = 10;
LiquidCrystal lcd(pin_RS, pin_EN, pin_d4, pin_d5, pin_d6, pin_d7);
void setup() {
  Serial.begin(9600);
  lcd.begin(16, 2);
  lcd.setCursor(0, 0);
  lcd.print("HOME AUTOMATION");
   lcd.autoscroll();
lcd.setCursor(0, 1);
  lcd.print("Vinay");
  lcd.autoscroll();
  lcd.setCursor(0, 2);
lcd.print("Rushwant");
```

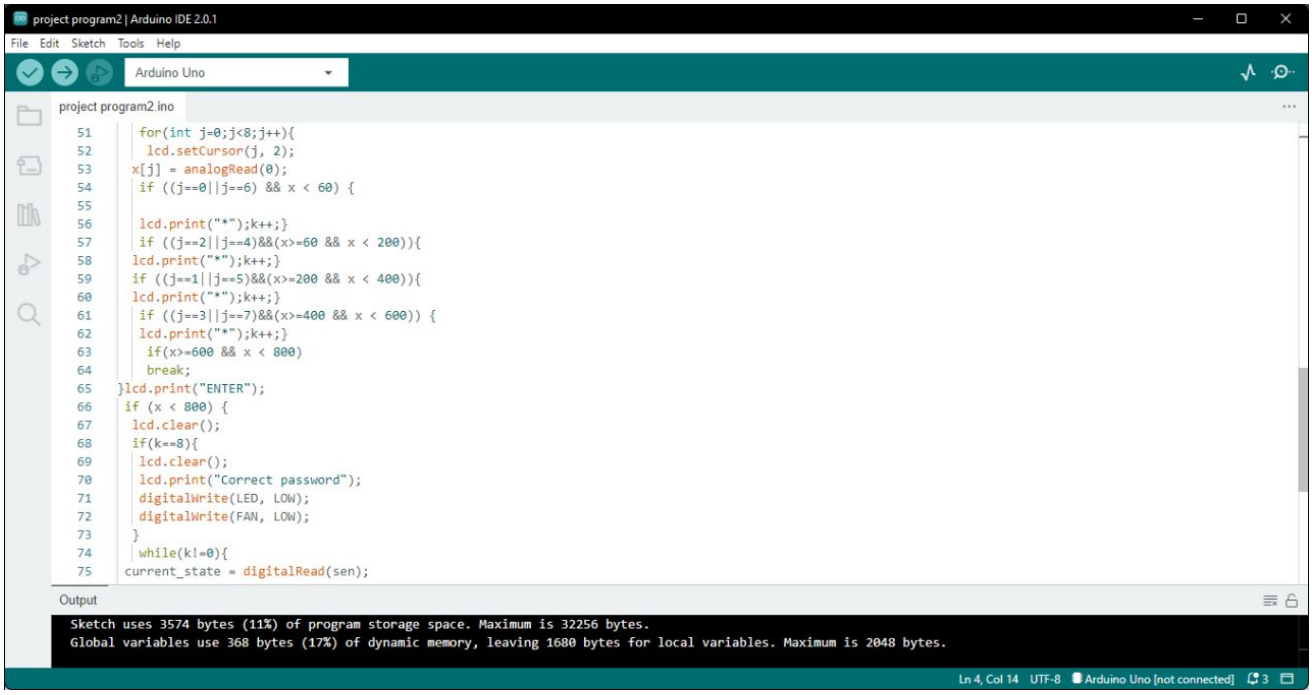
```
lcd.autoscroll();
lcd.setCursor(0, 3);
lcd.print("Paramesh");
lcd.autoscroll();
lcd.setCursor(0, 4);
lcd.print("Jishnu");
lcd.autoscroll();
lcd.setCursor(0, 5);
lcd.print("Gopi Sai");
lcd.autoscroll();
lcd.setCursor(0, 6);
lcd.print("Davidson");
 lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Enter password:");
  pinMode(LED, OUTPUT);
  pinMode(FAN, OUTPUT);
  pinMode(sen, INPUT);
}
void loop() {
  int last_state = LOW;
  int x[8],k;
  k=0;
    lcd.setCursor(0, 1);
   for(int j=0;j<8;j++){
    lcd.setCursor(j, 2);
  x[j] = analogRead(0);
   if ((j==0||j==6) && x < 60) {

   lcd.print("*");k++;}
```

```
  if ((j==2||j==4)&&(x>=60 && x < 200)){
 lcd.print("*");k++;}
 if ((j==1||j==5)&&(x>=200 && x < 400)){
 lcd.print("*");k++;}
  if ((j==3||j==7)&&(x>=400 && x < 600)) {
  lcd.print("*");k++;}
   if(x>=600 && x < 800)
   break;
}lcd.print("ENTER");
 if (x < 800) {
  lcd.clear();
 if(k==8){
  lcd.clear();
  lcd.print("Correct password");
  digitalWrite(LED, LOW);
  digitalWrite(FAN, LOW);
 }
  while(k!=0){
current_state = digitalRead(sen);
 if (last_state == HIGH && current_state == LOW) {
   if (state == LOW)
     state = HIGH;
   else if (state == HIGH)
     state = LOW;
     last_state = current_state;}
  lcd.setCursor(0, 0);
  lcd.clear();
  lcd.print("Welcome home");
  lcd.setCursor(0, 1);
   digitalWrite(LED, state);
```

```
   Serial.print("Light ON/OFF");
  digitalWrite(FAN, state);
   Serial.print("FAN ON/OFF");
 last_state = current_state;
 k--;
 }
}
}
```






project program2 | Arduino IDE 2.0.1
File Edit Sketch Tools Help
Arduino Uno
project program2.ino
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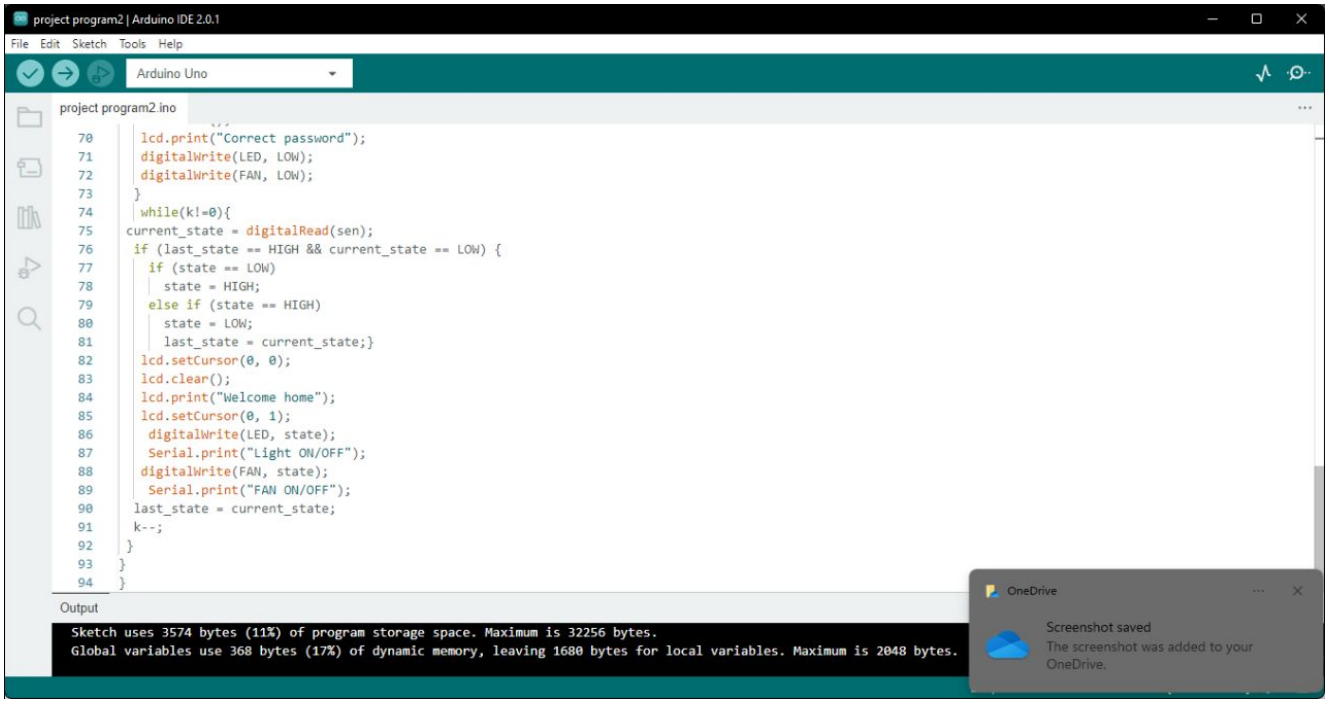
if (x < 800) {
lcd.clear();
if(k==8){
lcd.clear();
lcd.print("Correct password");
digitalWrite(LED, LOW);
digitalWrite(FAN, LOW);
}
while(k!=0){
current_state = digitalRead(sen);
Output
Sketch uses 3574 bytes (11%) of program storage space. Maximum is 32256 bytes.
Global variables use 368 bytes (17%) of dynamic memory, leaving 1680 bytes for local variables. Maximum is 2048 bytes.
Ln 4, Col 14 UTF-8 Arduino Uno [not connected] 3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digitalWrite(FAN, LOW);
}
while(k!=0){
current_state = digitalRead(sen);
if (last_state == HIGH && current_state == LOW) {
if (state == LOW)
state = HIGH;
else if (state == HIGH)
state = LOW;
last_state = current_state;}
lcd.setCursor(0, 0);
lcd.clear();
lcd.print("Welcome home");
lcd.setCursor(0, 1);
digitalWrite(LED, state);
Serial.print("Light ON/OFF");
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Serial.print("FAN ON/OFF");
last_state = current_state;
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OneDrive
Screenshot saved
The screenshot was added to your OneDrive.