PRACTICAL-8

AIM

Proteus Simulation for Home automation and smart city.

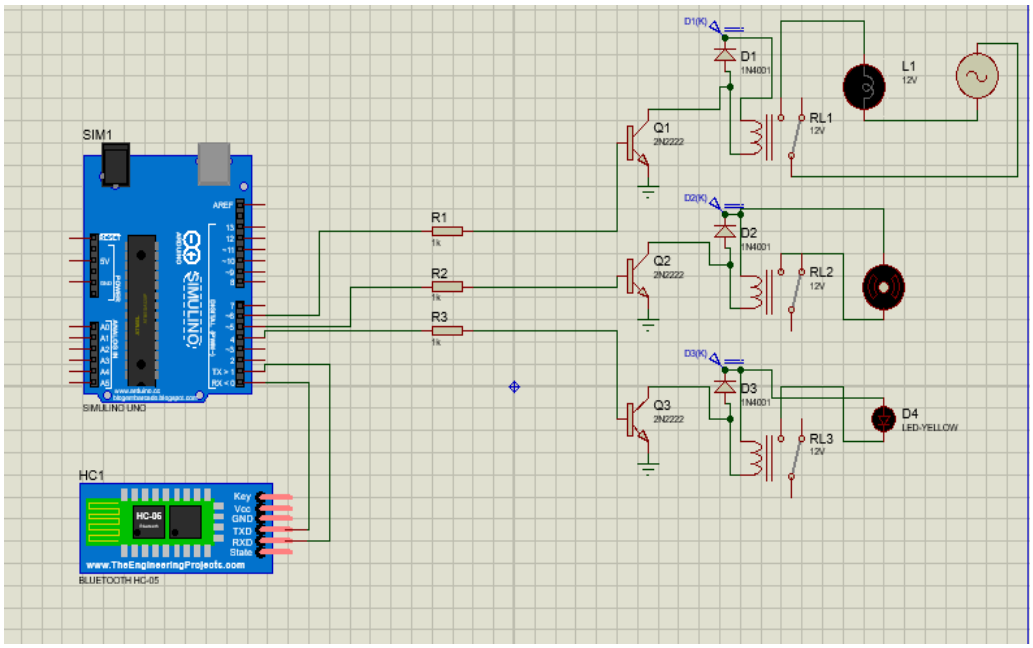
THEORY

Proteus:

- The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation.
- The software is used mainly by electronic design engineers and technicians to create schematics and electronic prints for manufacturing printed circuit boards.
- The Proteus Design Suite is a Windows application for schematic capture, simulation, and PCB (Printed Circuit Board) layout design.
- It can be purchased in many configurations, depending on the size of designs being produced and the requirements for microcontroller simulation.
- All PCB Design products include an autorouter and basic mixed mode SPICE simulation capabilities.
- The micro-controller simulation in Proteus works by applying either a hex file or a debug file to the microcontroller part on the schematic.
- It is then co-simulated along with any analog and digital electronics connected to it.
- This enables its use in a broad spectrum of project prototyping in areas such as motor control, temperature control and user interface design.
- It also finds use in the general hobbyist community and, since no hardware is required, is convenient to use as a training or teaching tool.

PRACTICAL

- Proteus has easy to use interface where we can drag and drop the components.
- We will make the following topology.



- Now we need to upload the code in Arduino.
- We will make the Hex file of the following code and upload it into Arduino.

```
String voice;
void setup() {
Serial.begin(9600);
pinMode(6, OUTPUT);
pinMode(5, OUTPUT);
pinMode(4, OUTPUT);
}
void loop() {
while(Serial.available()){
  delay(3);
  char c = Serial.read();
  voice+=c;}

if(voice.length() >0){
  Serial.println(voice);
  if(voice == "light on")
  {digitalWrite(6, HIGH);}
  else if(voice == "light off")
  {digitalWrite(6, LOW);}
  else if(voice == "fan on")
  {digitalWrite(5, HIGH);}
  else if(voice == "fan off")
  {digitalWrite(5, LOW);}
```

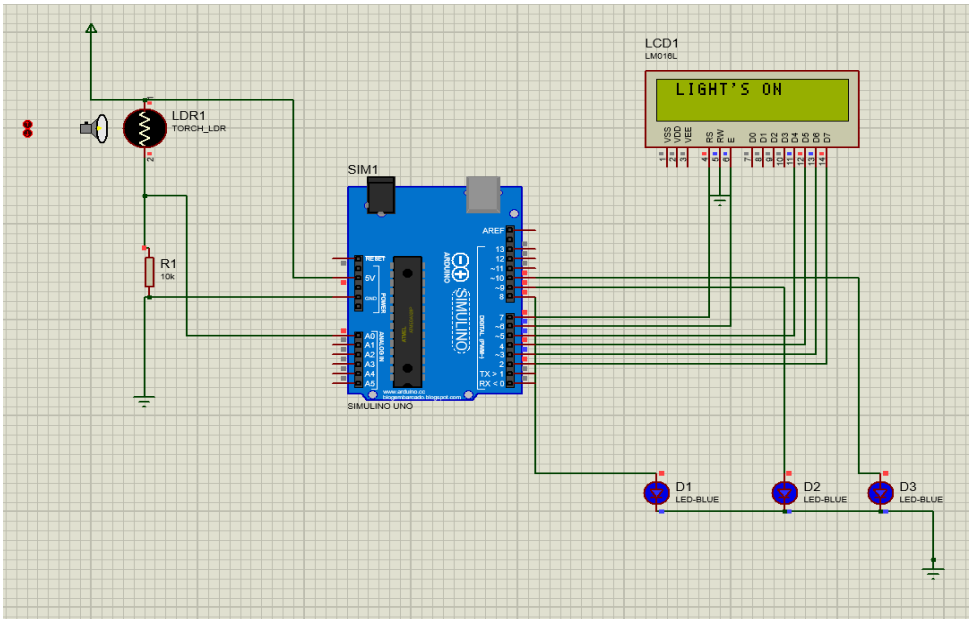
```
  else if(voice == "night lamp on")
  {digitalWrite(4, HIGH);}
  else if(voice == "night lamp off")
  {digitalWrite(4, LOW);}
  else if(voice == "all on")
  {digitalWrite(4, HIGH);
    digitalWrite(5, HIGH);
  digitalWrite(6, HIGH);}
  else if(voice == "all off")
  {digitalWrite(4, LOW);
    digitalWrite(5, LOW);
  digitalWrite(6, LOW);}
  voice = "";}
 }
```

- We will also make a simple mobile app to control the components attached with Arduino.

- We can also make the street light system for smart city by using following topology and code.

```
#include<LiquidCrystal.h>
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);
void setup() {
 pinMode(8,OUTPUT);
  pinMode(9,OUTPUT);
  pinMode(10,OUTPUT);
  lcd.begin(16,2);
  lcd.print("Ldr out = ");
  lcd.setCursor(0,1);
}
void loop()
{
  int a=analogRead(A0);
  lcd.setCursor(12,0);
  lcd.print(a);
  if(a<1)
  {
    lcd.setCursor(1,0);
    lcd.println("LIGHT'S OFF");
    digitalWrite(8,LOW);
    delay(500);
    digitalWrite(9,LOW);
    delay(500);
    digitalWrite(10,LOW);
  }
  if(a>1)
  {
    lcd.setCursor(1,0);
    lcd.println("LIGHT'S ON");
```

```
    digitalWrite(8,HIGH);
    delay(500);
    digitalWrite(9,HIGH);
    delay(500);
    digitalWrite(10,HIGH);
  }
}
```



CONCLUSION

In this practical, we learned about Proteus Design Suit and also implement Proteus Simulation for Home automation.