

## Assignment - 1

Assignment Date	19 September 2022
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Maximum Marks	2 Marks

### Home Automation System using Tinkercad

#### Program :

```
#include <Keypad.h>

#include <LiquidCrystal.h>

#include <Servo.h>

#define Password_Length 5

Servo myservo;

LiquidCrystal lcd(A0, A1, A2, A3, A4, A5);

int pos = 0;

char Data[Password_Length];

char Master[Password_Length] = "7890";

byte data_count = 0, master_count = 0;

bool Pass_is_good;

bool door = false;

char customKey;

const byte ROWS = 4;

const byte COLS = 4;

char keys[ROWS][COLS] = {{'1', '2', '3', 'A'}, {'4', '5', '6', 'B'}, {'7', '8', '9', 'C'}, {'*', '0', '#', 'D'}};

byte rowPins[ROWS] = {0, 1, 2, 3};

byte colPins[COLS] = {4, 5, 6, 7};

Keypad customKeypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS);

void setup()

{

    myservo.attach(9, 2000, 2400);

    ServoClose();
```

```
lcd.begin(16, 2);  
lcd.print("Protected Door");  
loading("Loading");  
lcd.clear();  
}
```

```
void loop()  
{  
  if (door == true)  
  {  
    customKey = customKeypad.getKey();  
    if (customKey == '#')  
    {  
      lcd.clear();  
      ServoClose();  
      lcd.print("Door is closed");  
      delay(3000);  
      door = false;  
    }  
  }  
  else  
    Open();  
}
```

```
void loading (char msg[]) {  
  lcd.setCursor(0, 1);  
  lcd.print(msg);  
  for (int i = 0; i < 9; i++) {  
    delay(1000);  
    lcd.print(".");  
  }  
}
```

```
}
```

```
void clearData()
```

```
{
```

```
    while (data_count != 0)
```

```
    {
```

```
        Data[data_count--] = 0;
```

```
    }
```

```
    return;
```

```
}
```

```
void ServoClose()
```

```
{
```

```
    for (pos = 90; pos >= 0; pos -= 10) {
```

```
        myservo.write(pos);
```

```
    }
```

```
}
```

```
void ServoOpen()
```

```
{
```

```
    for (pos = 0; pos <= 90; pos += 10) {
```

```
        myservo.write(pos);
```

```
    }
```

```
}
```

```
void Open()
```

```
{
```

```
    lcd.setCursor(0, 0);
```

```
    lcd.print("Enter Password");
```

```
    customKey = customKeypad.getKey();
```

```
    if (customKey)
```

```

{
    Data[data_count] = customKey;
    lcd.setCursor(data_count, 1);
    lcd.print(Data[data_count]);
    data_count++;
}

if (data_count == Password_Length - 1)
{
    if (!strcmp(Data, Master))
    {
        lcd.clear();
        ServoOpen();
        lcd.print(" Door is Open ");
        door = true;
        delay(5000);
        loading("Waiting");
        lcd.clear();
        lcd.print(" Time is up! ");
        delay(1000);
        ServoClose();
        door = false;
    }
    else
    {
        lcd.clear();
        lcd.print(" Wrong Password ");
        door = false;
    }
    delay(1000);
    lcd.clear();

```

```
clearData();  
}  
}
```

**Simulation Diagram :**

