Experiment - 9

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Semester: 6th semester **Subject: IOT LAB**

Aim:

Real Time application of controlling actuators through Bluetooth application using Arduino.

Objective:

1. Learn about controlling actuators through Bluetooth.
2. Learn about IoT programming.

Components Required:

1. 8 Male/Male Jumper Wires
2. 1 HC-05 Bluetooth Module
3. 1 (5 mm) LED: Red
4. 1 Arduino UNO
5. 1 Resistor 1k ohm

Theory:

Arduino:

It is an open-source electronics platform. It consists ATmega328 8-bit Micro controller. Itcanbe able to read inputs from different sensors & we can send instructions to the micro controllerin the Arduino. It provides Arduino IDE to write code & connect the hardware devices like Arduino boards & sensors.

LCD:

A Liquid Crystal Display commonly abbreviated as LCD is basically a display unit built using Liquid Crystal technology. When we build real life/real world electronics-based projects, we need a medium/device to display output values and messages. The most basic form of electronic display available is seven segment display, which has its own limitations. The next best available option is Liquid Crystal Displays which comes in different size specifications.

HC-05 Bluetooth Module:

HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration.

HC-05 module has two modes:

a) Data mode: Exchange of data between devices.

b) Command mode: It uses AT commands which are used to change setting of HC-05. To send these commands to module serial (USART) port is used.

I. VCC: Connect 5 V or 3.3 V to this Pin.

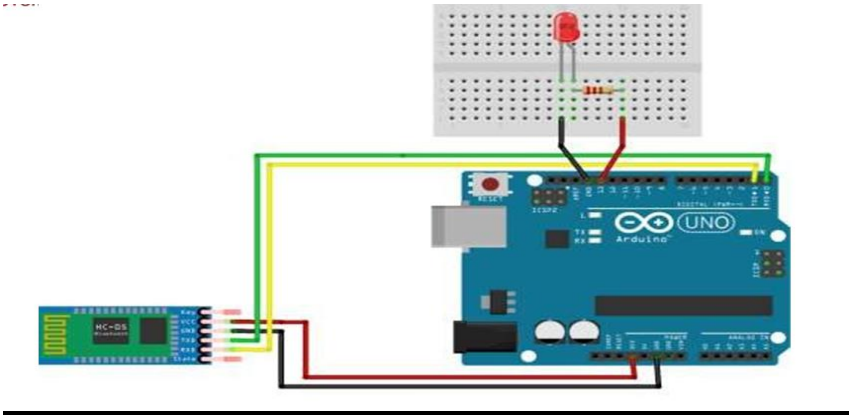
II. GND: Ground Pin of module.

III. TXD: Transmit Serial data (wirelessly received data by Bluetooth module transmitted out serially on TXD pin)

IV. RXD: Receive data serially (received data will be transmitted wirelessly by Bluetooth module).

V. State: It tells whether module is connected or not.

Circuit Diagram:

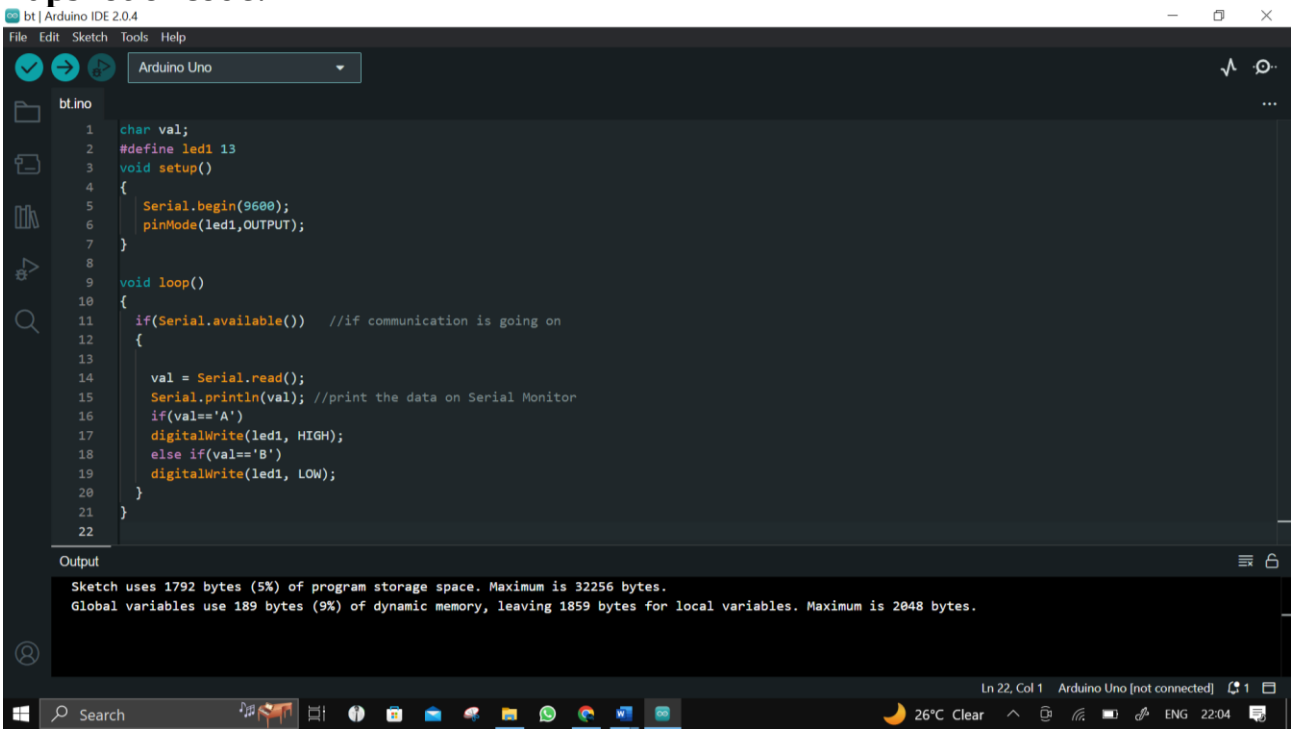


CODE:

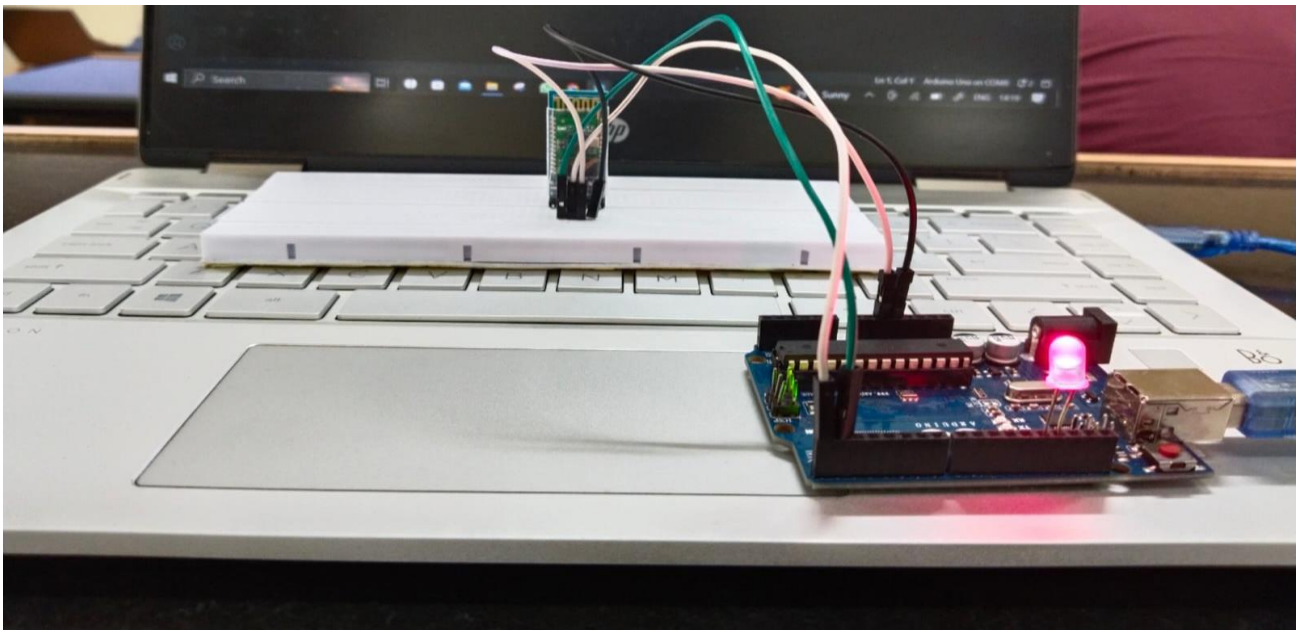
```
#include<SoftwareSerial.h>

SoftwareSerial bluetoothSerial(10, 11);

char switchstate;
int LED = 13;

void setup(){

        Serial.begin(9600);

        pinMode(LED,OUTPUT);
}
void loop(){

        while(Serial.avaliable() > 0){
        switchstate = Serial.read();
```

```
    if(switchstate == '1'){

    digitalWrite(13,HIGH);
    }
    else if(switchstate == '0'){

    digitalWrite(13,LOW);
    }

}
}
```

Snapshot of code:



Output:



Learning Outcomes:

1. Learn about IoT based simulations.
2. Learn about HC-05 Bluetooth Module.
3. Learn about how to control led using Bluetooth module using app