

# LAB REPORT : 9

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**GROUP:** 1

## **AIM OF THE EXPERIMENT:**

To establish a bi-directional serial communication between two microcontrollers (Arduino) and to send and receive data between the two microcontrollers(Arduino).

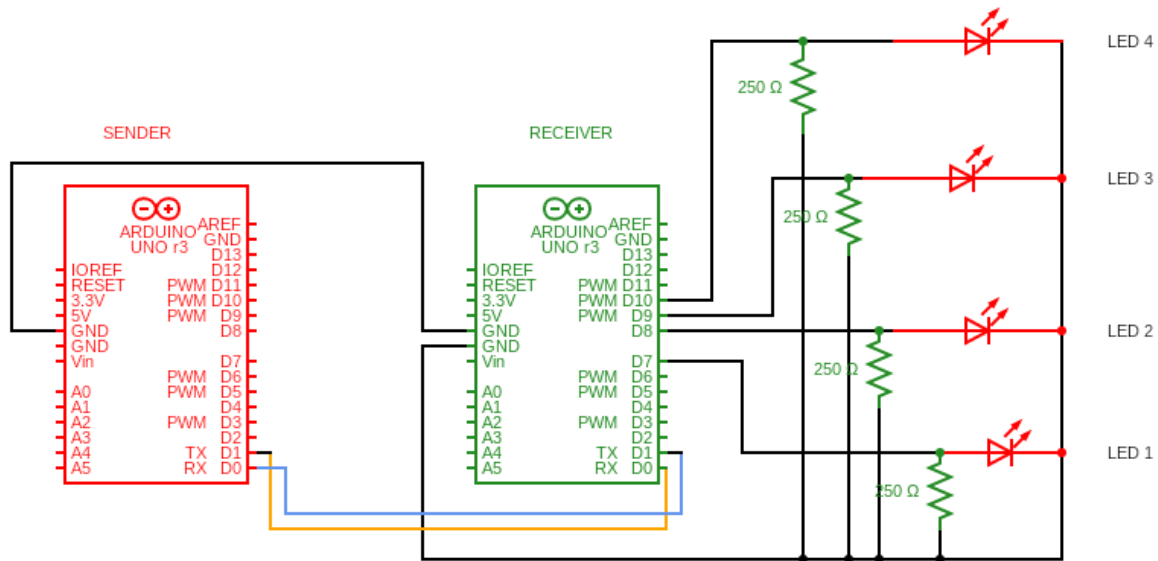
The data sent is in the form of an integer from 1 to 7 and the output receives by the second microcontroller is in the form of  $2^x$  which is displayed in binary form with the help of 4 output LEDs.

## **ELECTRONIC COMPONENTS USED:**

1. Two Arduino Uno R3
2. Four resistors of  $250\ \Omega$  each
3. Four Red LEDs
4. A bunch of connecting wires

## **REFERENCE CIRCUIT:**

## CIRCUIT DIAGRAM REPRESENTING A SERIAL COMMUNICATION BETWEEN TWO MICROCONTROLLERS(ARDUINO)



## PROCEDURE:

1. Provide all the ground connections from the Arduino to the breadboard first.
2. Connect the grounds of both the Arduinos together.
3. Connect the TX D1 pin of Arduino 1(Sender) to the TX D0 pin of Arduino 2(Receiver).
4. Connect the TX D0 pin of Arduino 1(Sender) to the TX D1 pin of Arduino 2(Receiver).
5. Take a wire from the Pin 7 of the Arduino and connect it to the cathode of LED 1 and ground the other end.
6. Take a wire from the Pin 8 of the Arduino and connect it to the cathode of LED 2 and ground the other end.
7. Take a wire from the Pin 9 of the Arduino and connect it to the cathode of LED 3 and ground the other end.

8. Take a wire from the Pin 10 of the Arduino and connect it to the cathode of LED 4 and ground the other end.
9. Feed an appropriate code into the Arduino 1(Sender) and Arduino 2(Receiver)to make the above circuit work.
10. Make sure all the connections are tight by crosschecking the wirings from the given circuit and make the necessary changes.

## CONCLUSION:

In this lab, we have successfully established a bi-directional serial communication between two microcontrollers (Arduino).

On the other hand,we have successfully sent and receive data between two microcontrollers.The sender Arduino sends a number between 1 to 7 and the receiver Arduino interprets it as  $2*x$  and displays the same in binary form by the help of four output LEDs that glow in order with respect to the output received.

**The code used for this simulation is embedded below :**

**CODE for Arduino 1 (Sender):**

```
1  //Sender
2  int x, y;
3  void setup()
4  {
5      Serial.begin(9600);
6  }
7
8  void loop()
9  {
10     if (Serial.available())
11     {
12         x = Serial.parseInt();
13         y = 2 * x;
14         Serial.println(y);
15     }
16     delay(1000);
17 }
```

**CODE for Arduino 2( Receiver):**

```

1 //Receiver
2 int Pin1 = 7;
3 int Pin2 = 8;
4 int Pin3 = 9;
5 int Pin4 = 10;
6
7 int a,x;
8 int arr[4] = {Pin1, Pin2, Pin3, Pin4};
9
10
11 void setup()
12 {
13     pinMode(Pin1, OUTPUT);
14     pinMode(Pin2, OUTPUT);
15     pinMode(Pin3, OUTPUT);
16     pinMode(Pin4, OUTPUT);
17
18     Serial.begin(9600);
19 }
20
21 void loop()
22 {
23     for(int i = 0; i < 8; i++)
24     {
25         Serial.println(i);
26
27         if (Serial.available())
28         {
29             x = Serial.parseInt();
30
31             for(int j = 0; j < 4; j++)
32             {
33                 a = x % 2;
34                 digitalWrite(arr[j], a);
35
36                 x=x/2;
37             }
38         }
39         delay(1000);
40     }
41 }
42
43

```

## LINK FOR TINKERCAD SIMULATION:

Tinkercad | From mind to design in minutes

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[https://www.tinkercad.com/things/d8HaI8Fmf2p-lab9/editel?sharecode=hjp-YlViAny7hyQIdmu0BSMkgY\\_ljflXg9NU0imIN-Y](https://www.tinkercad.com/things/d8HaI8Fmf2p-lab9/editel?sharecode=hjp-YlViAny7hyQIdmu0BSMkgY_ljflXg9NU0imIN-Y)



## THANK YOU!