LAB REPORT : 9

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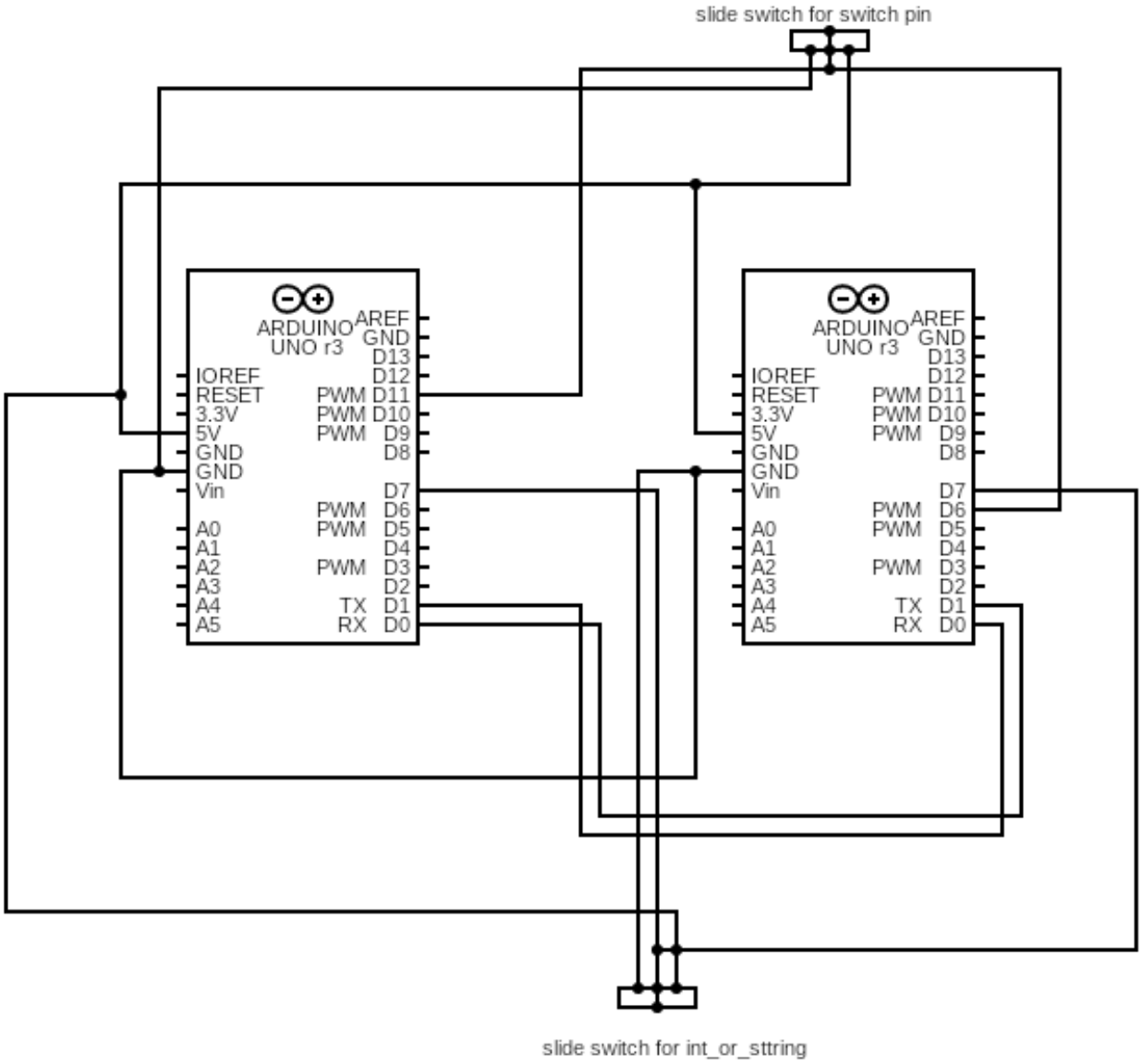
Aim : 1) To establish a bi-directional serial communication between two microcontrollers (Arduino)
2) To send and receive data (both string and numbers) between two microcontrollers.

Electronic components : Arduino Uno R3 , Connecting wires , Slide Switches .

Reference circuit diagram:



Prodecure:

1. Take two Arduino’s , Now we need to build communication between the Arduino’s.

2. Connect TX pin of transmitter Arduino to the RX pin of the receiver Arduino.

3. Then, again we need to connect RX pin of the transmitter Arduino to the TX pin of the receiver Arduino , to establish to and fro communication .

4. Connect ground of any one arduino to the second one.

5. We are doing switch based. Use one switch for determining flow of data in between arduino’s . For building this switch we connect pin 11 and pin 6 of arduino’s 1 and 2 respectively to slide switch . We will make it function as : When its low we transmit data from Arduino 1 to 2 , and vice versa.

6.We take another slide switch which is used to tell our program to work on int or strings. Here we connect pin7 of both the Arduinos to this slide switch , if low we will work with Strings else with integers.

7.Write the code seperately for both the Arduino’s :

Arduino 1 code :

```
char Send[6] = "Hello"; //String data
char Recieve[10];
int decide = LOW;
int switchPin = 11;
int data_type_pin = 7;
int int_or_String = LOW;
int x = 1;
void setup() {

Serial.begin(9600);
pinMode(switchPin, INPUT);
pinMode(data_type_pin, INPUT);

}

void loop() {
  int_or_String = digitalRead(data_type_pin);

  //if int_to_string is LOW we will work with string else
  //we will work with int .

  //if switchPin is Low we will tansmit data
  //else we will read data.

  if(int_or_String == LOW){
          decide = digitalRead(switchPin);
          if(decide==LOW)
```

```
        {
                Serial.write(Send,5); //Write the serial data
                delay(5000);
        }
        else{
        Serial.readBytes(Recieve,8); //Read's the serial data
        Serial.println(Recieve);//Print data on Serial Monitor
;
        delay(5000);
        }
  }
  else{
    decide = digitalRead(switchPin);
    if(decide==LOW){
      Serial.println(x);
      delay(2000);
            }
    else{
      int read = Serial.parseInt();
      Serial.print("Recived");
      Serial.println(read);
      delay(2000);
    }
  }
}
```

Arduino2 code:

```
char Send[9] = "LabsOver"; //String data
char Recieve[10];
int decide = LOW;
//int compare = LOW;
int switchPin = 6;
int data_type_pin = 7;
int int_or_String = LOW;
int x = 2;
void setup()
{

        Serial.begin(9600);
        pinMode(data_type_pin, INPUT);
        pinMode(switchPin, INPUT);
}
void loop()
{

  //if int_to_string is LOW we will work with string else
  //we will work with int .

  //if switchPin is HIGH we will tansmit data
```

```
 //else we will read data.


 int_or_String = digitalRead(data_type_pin);
 if(int_or_String == LOW){
        decide = digitalRead(switchPin);
        if(decide==LOW)
        {
                Serial.readBytes(Recieve,5); //Read's the serial data
                Serial.println(Recieve);//Print data on Serial Monitor
                delay(5000);
        }
        else
        {
                Serial.write(Send,8);//Write the serial data
                delay(5000);
        }
 }
 else{
        decide = digitalRead(switchPin);
        if(decide==HIGH){
                Serial.println(x);
                delay(2000);
                }
        else{
                int read = Serial.parseInt();
                Serial.print("Recived");
                Serial.println(read);
                delay(2000);
        }
        }
}
```

Conclusion :

Switch_pin	int_or_string	Function
LOW	LOW	Transmit’s String from Arduino 1 to 2
LOW	HIGH	Transmit’s Integers from Arduino 1 to 2
HIGH	LOW	Transmit’s String from Arduino 2 to 1
HIGH	HIGH	Transmit’s Integers from Arduino 2 to 1

Reference circuit link: https://www.tinkercad.com/things/j4j7M6vphVM