**BÀI TH10.1:**

**Master:**

void setup() {

pinMode(8, INPUT\_PULLUP); // Button connected to pin 8

pinMode(13, OUTPUT); // LED connected to pin 13

digitalWrite(13, LOW); // Initially turn off the LED

Serial.begin(9600); // Starts the serial communication at 9600 baud rate

}

void loop() {

if(Serial.available()){

char data\_rcvd = Serial.read();

if(data\_rcvd == '1') digitalWrite(13, HIGH); // If received '1', turn on the LED

if(data\_rcvd == '0') digitalWrite(13, LOW); // If received '0', turn off the LED

}

if(digitalRead(8) == LOW) { // If button is pressed (reads LOW due to INPUT\_PULLUP)

Serial.write('1'); // Send '1' over serial

} else {

Serial.write('0'); // Otherwise, send '0' over serial

}

}

**Slave:**  
void setup() {

pinMode(8, INPUT\_PULLUP); // Button connected to pin 8

pinMode(13, OUTPUT); // LED connected to pin 13

digitalWrite(13, LOW); // Initially turn off the LED

Serial.begin(9600); // Starts the serial communication at 9600 baud rate

}

void loop() {

if(Serial.available()){

char data\_rcvd = Serial.read();

if(data\_rcvd == '1') digitalWrite(13, HIGH); // If received '1', turn on the LED

if(data\_rcvd == '0') digitalWrite(13, LOW); // If received '0', turn off the LED

}

if(digitalRead(8) == LOW) { // If button is pressed (reads LOW due to INPUT\_PULLUP)

Serial.write('1'); // Send '1' over serial

} else {

Serial.write('0'); // Otherwise, send '0' over serial

}

}

**BÀI TH10.2:**

**Master:**

#include<SPI.h>

#define push 2

#define LED 4

int x;

int value;

void setup (void)

{

Serial.begin(115200);

pinMode(push,INPUT);

pinMode(LED,OUTPUT);

SPI.begin();

SPI.setClockDivider(SPI\_CLOCK\_DIV8);

digitalWrite(SS,HIGH);

}

void loop(void)

{

byte m\_send,m\_receive;

value = digitalRead(push);

if(value == HIGH)

{

x = 1;

}

else

{

x = 0;

}

digitalWrite(SS, LOW);

m\_send = x;

m\_receive=SPI.transfer(m\_send);

if(m\_receive == 1)

{

digitalWrite(LED,HIGH);

}

else

{

digitalWrite(LED,LOW);

}

delay(1000);

}

**Slave:**

#include<SPI.h>

#define inputbutton 2

#define outputLED 4

volatile boolean received;

volatile byte Slavereceived,Slavesend;

int buttonvalue;

int x;

void setup()

{

Serial.begin(115200);

pinMode(inputbutton,INPUT);

pinMode(outputLED,OUTPUT);

pinMode(MISO,OUTPUT);

SPCR |= \_BV(SPE);

received = false;

SPI.attachInterrupt();

}

ISR (SPI\_STC\_vect)

{

Slavereceived = SPDR;

received = true;

}

void loop()

{

if(received)

{

if (Slavereceived==1)

{

digitalWrite(outputLED,HIGH);

}else

{

digitalWrite(outputLED,LOW);

}

buttonvalue = digitalRead(inputbutton);

if (buttonvalue == HIGH)

{

x=1;

}else

{

x=0;

}

Slavesend=x;

SPDR = Slavesend;

delay(1000);

}

}

**BÀI TH10.3:  
Master:**

// I2C Master

#include <Wire.h>

int LED=13;

int x = 0;

void setup() {

// Start the I2C Bus as Master

Wire.begin();

Serial.begin(9600);

pinMode(LED,OUTPUT);

}

void loop() {

Wire.beginTransmission(9); // transmit to device #9

Wire.write(x); // sends x

Wire.endTransmission(); // stop transmitting

x++; // Increment x

if (x > 200) x = 0; // `reset x once it gets 6

Serial.println(x);

if (x <=100) digitalWrite(LED, HIGH);

else digitalWrite(LED, LOW);

}

**Slave:**// I2C Slave

#include <Wire.h>

int LED = 13;

int x = 0;

void setup() {

// Define the LED pin as Output

pinMode (LED, OUTPUT);

// Start the I2C Bus as Slave on address 9

Wire.begin(9);

// Attach a function to trigger when something is received.

Wire.onReceive(receiveEvent);

Serial.begin(9600);

}

void receiveEvent(int bytes) {

x = Wire.read(); // read one character from the I2C

}

void loop() {

//If value received is 0 blink LED for 200 ms

Serial.println(x);

if (x <=100) digitalWrite(LED, HIGH);

else digitalWrite(LED, LOW);

}