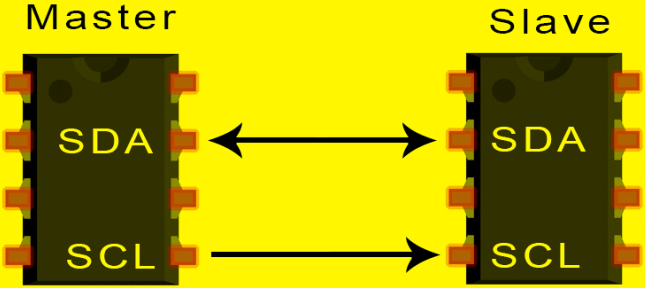
I²C

Inter-Integrated Circuits

@ aditi-narain



Let's explore ❯❯

What is I2C ?

I2C is serial communication protocol
(One bit at a time)

Uses two wires protocol SDA SCK
Both are pulled-up by default

Application

Used in communication between microcontroller and sensors array, IOT devices or EEPROM

Master- Initiates transmission
Slave- Addressed by master

Runs on 2 mode

Master sends data to Slave.
Master request data from Slave.

Working

Start Condition

Address (Slave) and Direction

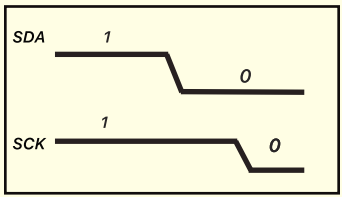
(7 Bit address of slave to which master wants to interact
+
(Read '1' /Write '0'))

Data Bytes

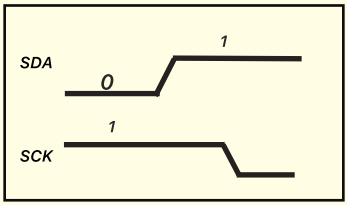
don't changes the data when SCK is high,
it holds the value

Acknowledge Bit

Stop Condition



Start Condition

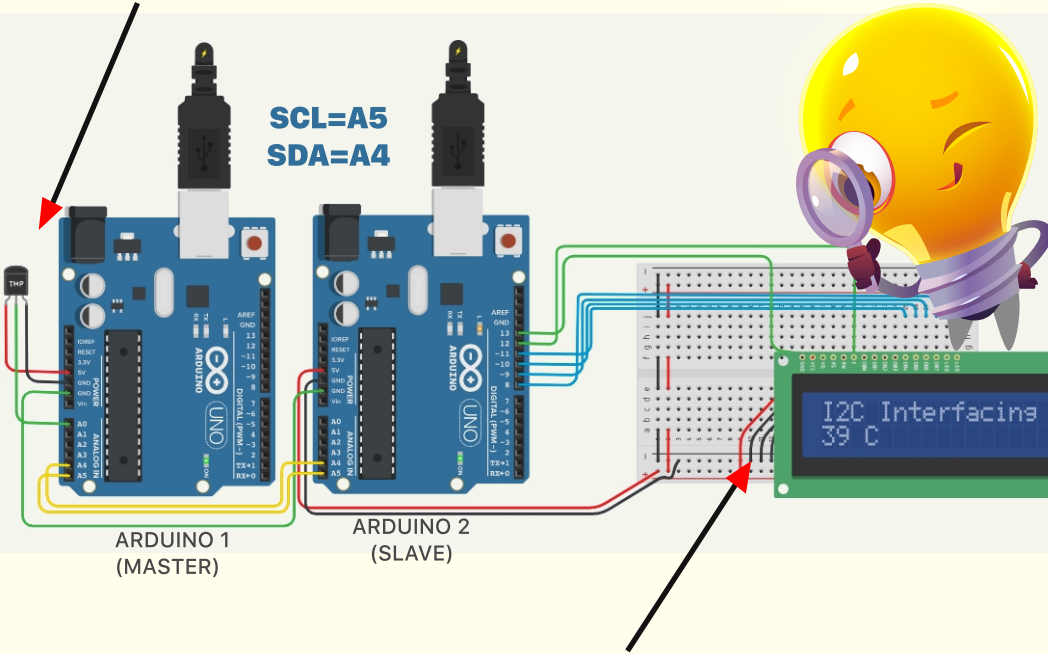


Stop Condition

MEASURING THE TEMPERATURE & DISPLAY ON LCD

SENDING DATA TO SLAVE

Input (Temperature) from master arduino is send to Slave



Temperature received from master arduino is received by slave (arduino 2) which displays it on LCD

SLAVE

```
#include <LiquidCrystal.h>
#include <Wire.h>

LiquidCrystal lcd(13, 12, 11, 10, 9, 8);
//LiquidCrystal lcd(rs, en, d4, d5, d6, d7);


void setup()
{
  Wire.begin(3);
  Wire.onReceive(receiveEvent);
  lcd.begin(16,2);
  Serial.begin(9600);
  lcd.setCursor(0,0);
  lcd.print("I2C Interfacing");

  }
  void loop() {


  Event(int howMany)
  {
   int x=Wire.read();
   lcd.setCursor(0,1);
   if(x>125)
   {
    x=256-x;
    x*=-1;
   }
   lcd.print(x);
   Serial.println(x);
   lcd.setCursor(4,1);
   lcd.print(" ° C");
    delay(5000);
   }
```

MASTER

```
#include <Wire.h>
//define sensor A0

void setup()
  {
  Wire.begin();//to start the I2C Communication
  pinMode(A0,INPUT);
  Serial.begin(9600);
  }

void loop()
{
  Wire.beginTransmission(3);
  int v=analogRead(A0);//input in terms of voltage
  int  c=(v- 20) * 3.03;//toconvert into celcius

   int temp=map(celcius,0,1023,-40,125);
   Wire.write(temp);
   Wire.endTransmission();
    delay(500);
  }
```

THANKYOU

@ aditi-narain