Exercise

Hardware

- Connect Pi **SDA** (GPIO 2) → Arduino **A4**
- Connect Pi **SCL** (GPIO 3) → Arduino **A5**
- Common GND between Pi & Arduino
- **3.3 V pull-ups** on SDA/SCL (Pi usually has them already)
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Potentiometer wiring on the Arduino

- One outer leg → 5 V on Arduino
- Other outer leg → GND on Arduino
- Wiper (middle) → Arduino analog input A0

Arduino as I²C slave

```
cpp
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#include <Wire.h>
const int SLAVE_ADDR = 0x08;

void setup() {
  Wire.begin(SLAVE_ADDR);
  Wire.onRequest([]() {
    int val = analogRead(A0);
    // send high byte then low byte
    Wire.write(highByte(val));
    Wire.write(lowByte(val));
  });
}

void loop() {
  // nothing needed here
}
```

Pi master code (with `sudo apt install python3-smbus`):

```
python
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import smbus, time

BUS = smbus.SMBus(1)
ADDR = 0x08

def read_pot():
    data = BUS.read_i2c_block_data(ADDR, 0, 2)
    raw = (data[0] << 8) | data[1]
    return raw

while True:
    raw = read_pot()
    voltage = raw * 5.0 / 1023.0
    print(f"Raw={raw}\tVoltage={voltage:.2f} V")
    time.sleep(0.1)
```