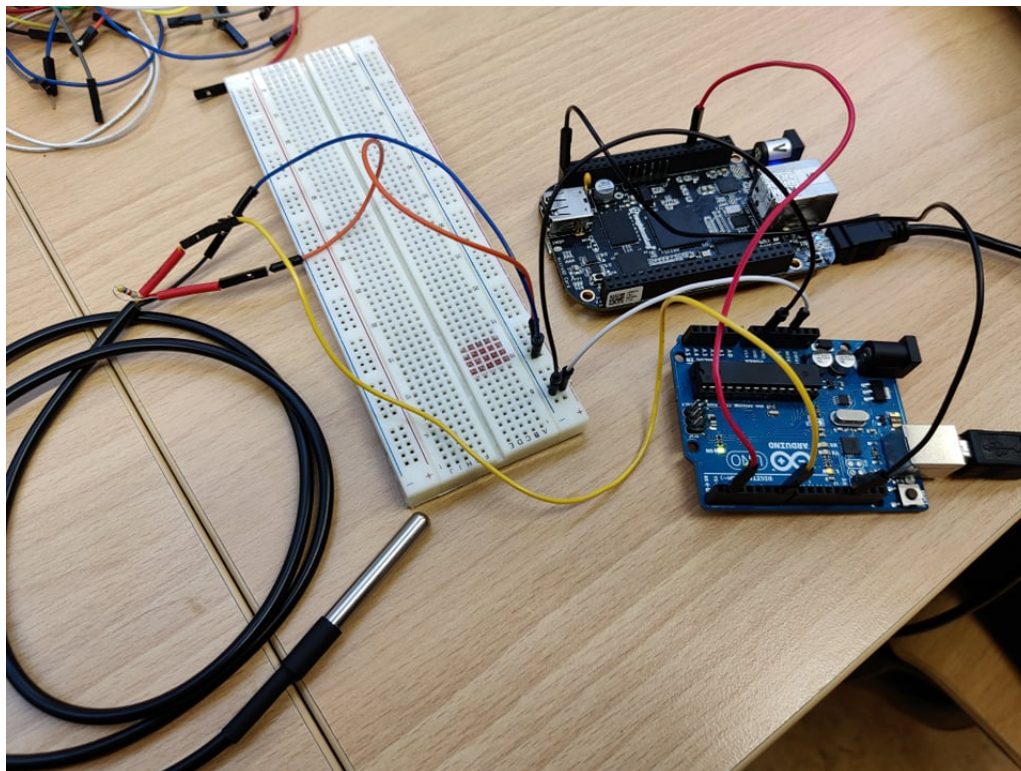


Laboratorium z przedmiotu Systemy wbudowane (SW)			
Zadanie nr 6			
BeagleBone Black – komunikacja			
Prowadzący	Autor	Grupa dziekańska	Ocena
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Schemat połączenia:



Kod programu z Arduino:

```

#include <DS18B20.h>
#include <OneWire.h>
#define ONEWIRE_PIN 7
byte address[8] = {0x28, 0x12, 0xB, 0x79, 0x97, 0x11, 0x3, 0xF8};
OneWire onewire(ONEWIRE_PIN);
DS18B20 sensors(&onewire);
int i = 0;
float temperatures[18];
int ma(float arr[]);
int mi(float arr[]);
float srednia(float arr[]);

void setup() {
    while(!Serial);
    Serial.begin(9600);
    sensors.begin();
    sensors.request(address);
}

```

```

void loop() {
    if (sensors.available() && i<18){
        //odczyt temperatury
        temperatures[i] = sensors.readTemperature(address);
        sensors.request(address);
        i++;
    } else if(i==18){
        Serial.println(srednia(temperatures)); // wysłanie średniej temperatury do BeagleBone
        i=0;
    }
}

```

```

int ma(float arr[]){
    float maxi = arr[0];
    int iter = 0;
    for (int i = 1; i<18;i++){
        if (arr[i] > maxi){
            maxi = arr[i];
            iter = i;
        }
    }
    return iter;
}

```

```

int mi(float arr[]){
    float mini = arr[0];
    int iter = 0;
    for (int i = 1; i<18;i++){
        if (arr[i] < mini){
            mini = arr[i];
            iter = i;
        }
    }
    return iter;
}

```

```

float srednia(float arr[]){
    int min_iter = mi(arr);
    int max_iter = ma(arr);
    float sum = 0.0;
    for(int i=0; i<18; i++){
        if(i != min_iter && i != max_iter){
            sum += arr[i];
        }
    }
    return sum/16;
}

```

```
}
```

Utworzenie bazy danych:

```
debian@beaglebone:~/KDA$ sqlite3 baza_sw6  
sqlite> create table pomiary (temp NUMBER);
```

Kod programu z BeagleBone:

```
import Adafruit_BBIO.UART as UART  
import serial  
import sqlite3
```

```
UART.setup("UART4")
```

```
con = sqlite3.connect('baza_sw6')  
cur = con.cursor()
```

```
ser = serial.Serial(port = "/dev/ttyO4", baudrate=9600)  
ser.close()  
ser.open()
```

```
for i in range(5):
```

```
    if ser.isOpen():
```

```
        avg_temp = ser.readline() //odczyt temperatury przesłanej z arduino
```

```
        avg_temp = float(avg_temp)
```

```
        cur.execute("INSERT INTO pomiary VALUES(?)", (avg_temp,)) //zapis do bazy danych
```

```
ser.close()
```

```
cur.execute("SELECT * FROM pomiary")
```

```
print(cur.fetchall())
```

```
con.commit()
```

```
con.close()
```

Sprawdzenie danych zapisanych w bazie:

```
debian@beaglebone:~/KDA$ sqlite3 baza_sw6
```

```
sqlite> select * from pomiary;
```

```
25.58
```

```
25.55
```

```
25.5
```

```
25.51
```

```
28.58
```