LAPORAN PRAKTIKUM MINGGU KE-7
"DHT11"
INTERNET OF THINGS

Disusun oleh:

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D4 TEKNIK INFORMATIKA

TEKNOLOGI INFORMASI

POLITEKNIK NEGERI MALANG

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PRACTICUM

An experiment to capture temperature and humidity data with the DHT11 sensor.

Program Code :

```
#include <Arduino.h>
#include <SimpleDHT.h>

#define pinDHT 7      // SD3 pin signal sensor DHT

byte temperature = 0;
byte humidity = 0;

SimpleDHT11 dht11(D7); // instan sensor dht11

void TemperatureHumidity()
{
  int err = SimpleDHTErrSuccess;

  if ((err = dht11.read(&temperature, &humidity, NULL)) !=
SimpleDHTErrSuccess)
  {
    Serial.print("Read DHT11 failed, err=");
    Serial.println(err);
    delay(1000);
    return;
  }

  float c = temperature;
  float k = temperature + 273.15;
  float r = 0.8 * temperature;


  Serial.println("==============================");
  Serial.print("Celcius Temp  : ");
  Serial.print(c);
  Serial.print(" *C, ");
  Serial.println();
  Serial.print("Kelvin Temp   : ");
  Serial.print(k);
  Serial.print(" *K, ");
  Serial.println();
  Serial.print("Reamur Temp   : ");
  Serial.print(r);
  Serial.print(" *R, ");
  Serial.println();
  Serial.print("Humidity      : ");
  Serial.print(humidity);
  Serial.print(" H, ");
  Serial.println();
  Serial.println("==============================");

}

void setup()
{
  Serial.begin(115200);
  Serial.println("Simple DHT");
```
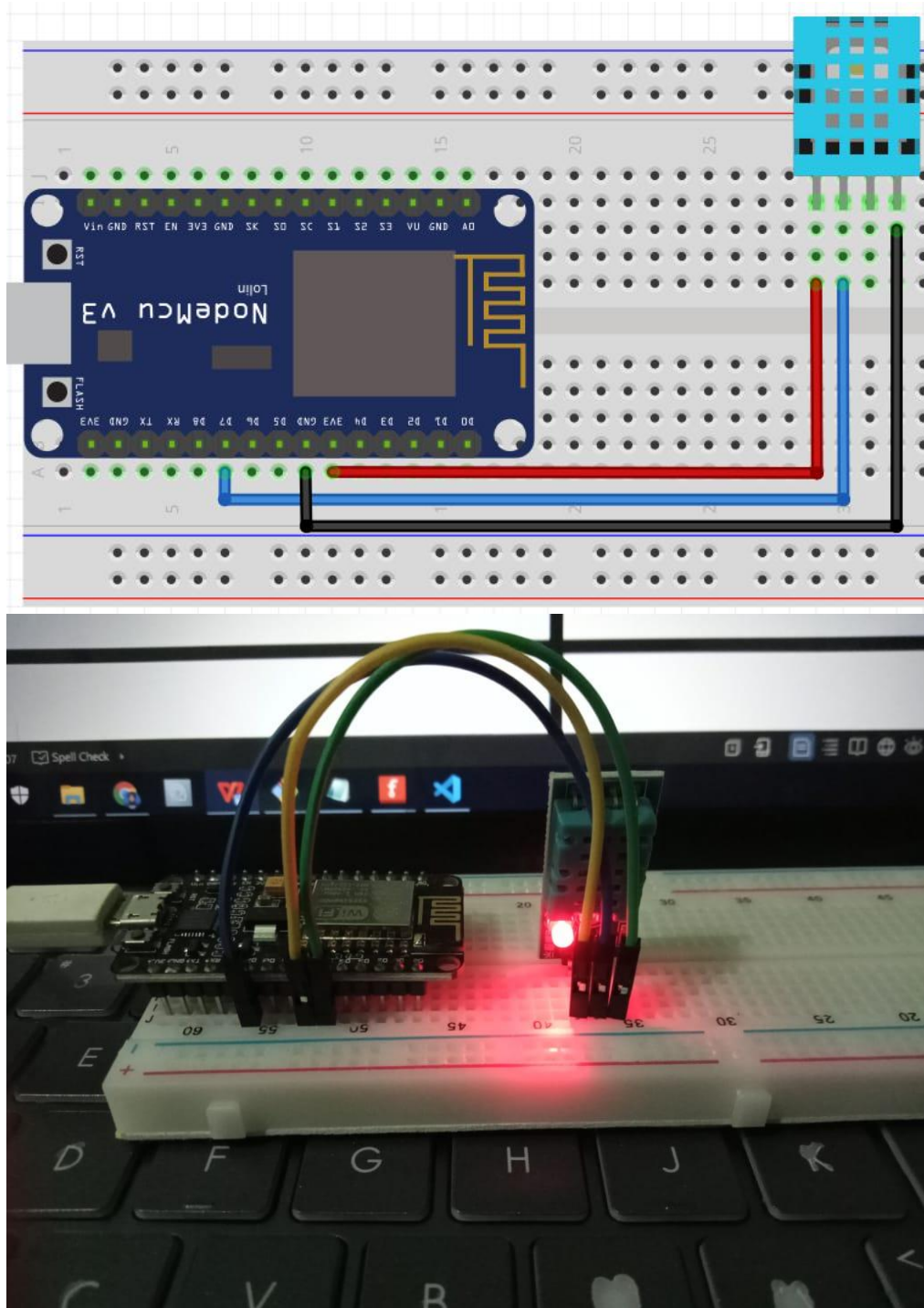
```
    delay(1000);
}

void loop()
{
  TemperatureHumidity();
  Serial.println("");
  delay(4000);
}
```

Schema :

Result :

Explanation:

In this practicum, the activities carried out are making a series of iots to detect air temperature and humidity. In the code above, the pin to detect data is on pin D7, then the code also uses the winlinvip/SimpleDHT@^1.0.14 library because previously the temperature data obtained was not accurate. From the practicum, temperature data is obtained in Celsius format, and air humidity

TASK

1. Modify the code line in the practicum section so that temperature data appears in Kelvin and Reaumur units!

   Answer :
   Code

```
#include <Arduino.h>
#include <SimpleDHT.h>

#define pinDHT 7     // SD3 pin signal sensor DHT

byte temperature = 0;
byte humidity = 0;

SimpleDHT11 dht11(D7); // instan sensor dht11

void TemperatureHumidity()
{
  int err = SimpleDHTErrSuccess;

  if ((err = dht11.read(&temperature, &humidity, NULL)) !=
SimpleDHTErrSuccess)
  {
    Serial.print("Read DHT11 failed, err=");
    Serial.println(err);
    delay(1000);
    return;
  }

  float c = temperature;
  float k = temperature + 273.15;
  float r = 0.8 * temperature;
```
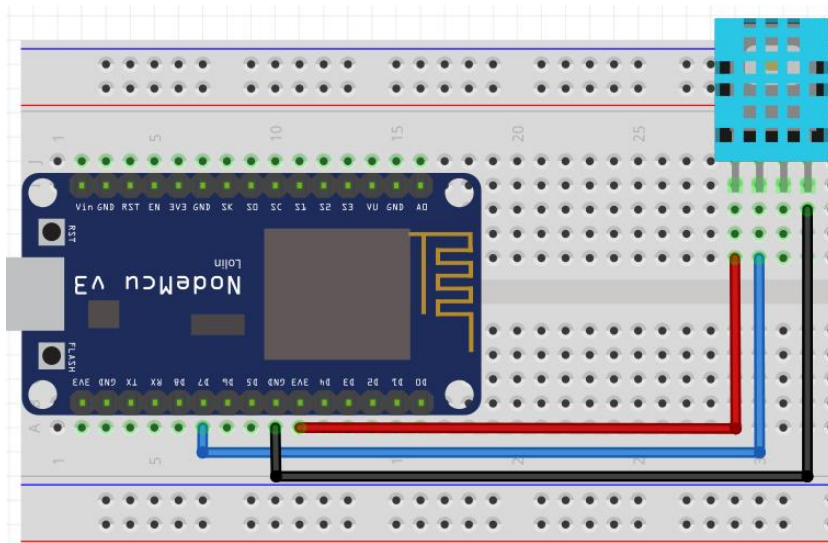
```
    Serial.println("==============================");
    Serial.print("Celcius Temp  : ");
    Serial.print(c);
    Serial.print(" *C, ");
    Serial.println();
    Serial.print("Kelvin Temp   : ");
    Serial.print(k);
    Serial.print(" *K, ");
    Serial.println();
    Serial.print("Reamur Temp   : ");
    Serial.print(r);
    Serial.print(" *R, ");
    Serial.println();
    Serial.print("Humidity      : ");
    Serial.print(humidity);
    Serial.print(" H, ");
    Serial.println();
    Serial.println("==============================");

}

void setup()
{
    Serial.begin(115200);
    Serial.println("Simple DHT");
    delay(1000);
}

void loop()
{
    TemperatureHumidity();
    Serial.println("");
    delay(4000);
}
```

Schema :

Result:

Explanation:

In task number one, changes were made where the previously obtained temperature was converted from Celsius to Kelvin and Fahrenheit with the following code.

```
float c = temperature;
float k = temperature + 273.15;
float r = 0.8 * temperature;
```

Kelvin Reamur temperature uses the float data type so that it can display decimal numbers

2. Make a simulation of a temperature and humidity reader in the middle of the city by using an LED light as an indicator accompanied by a description of the temperature and humidity data displayed on the serial monitor!

    Example: The temperature in a city is categorized as cold, normal, and hot. Each category has an LED indicator that lights up, one of which is when the cold category is represented by a green LED, normal is represented by a Blue LED, and hot is represented by a Red LED. If you don't have RGB LEDs, please use the LED build in NODEMCU.

    Answer:
    Code

```
#include <Arduino.h>
#include <SimpleDHT.h>

#define pinDHT 7      // SD3 pin signal sensor DHT
#define RED_LED D2    // set red led in pin d4
#define GREEN_LED D3 // set gree led in pin d5
#define BLUE_LED D4   // set blue led in pin d6

byte temperature = 0;
byte humidity = 0;

SimpleDHT11 dht11(D7); // instan sensor dht11

void TemperatureCategory()
{
  int err = SimpleDHTErrSuccess;

  if ((err = dht11.read(&temperature, &humidity, NULL)) !=
SimpleDHTErrSuccess)
  {
    Serial.print("Pembacaan DHT11 gagal, err=");
    Serial.println(err);
    delay(1000);
    return;
  }

  float c = temperature;
  float k = temperature + 273.15;
  float r = 0.8 * temperature;

  if ((int)temperature <= 24)
  {
    Serial.println("==============================");
    digitalWrite(RED_LED, HIGH);
    digitalWrite(GREEN_LED, LOW);
    digitalWrite(BLUE_LED, LOW);
    Serial.println("Temperatur    : Cold");
    Serial.println("LED           : RED");
    Serial.print("Celcius Temp  : ");
    Serial.print(c);
    Serial.print(" *C, ");
    Serial.println();
    Serial.print("Kelvin Temp   : ");
    Serial.print(k);
    Serial.print(" *K, ");
```

```
    Serial.println();
    Serial.print("Reamur Temp   : ");
    Serial.print(r);
    Serial.print(" *R, ");
    Serial.println();
    Serial.println("=============================");

  }

  else if ((int)temperature > 24 && (int)temperature <= 37)
  {
    Serial.println("=============================");
    digitalWrite(RED_LED, LOW);
    digitalWrite(GREEN_LED, HIGH);
    digitalWrite(BLUE_LED, LOW);
    Serial.println("Temperatur    : Normal");
    Serial.println("LED           : GREEN");
    Serial.print("Celcius Temp  : ");
    Serial.print(c);
    Serial.print(" *C, ");
    Serial.println();
    Serial.print("Kelvin Temp   : ");
    Serial.print(k);
    Serial.print(" *K, ");
    Serial.println();
    Serial.print("Reamur Temp   : ");
    Serial.print(r);
    Serial.print(" *R, ");
    Serial.println();
    Serial.println("=============================");

  }

  else
  {
    Serial.println("=============================");
    digitalWrite(RED_LED, LOW);
    digitalWrite(GREEN_LED, LOW);
    digitalWrite(BLUE_LED, HIGH);
    Serial.println("Temperatur    : Hot");
    Serial.println("LED           : BLUE");
    Serial.print("Celcius Temp  : ");
    Serial.print(c);
    Serial.print(" *C, ");
    Serial.println();
    Serial.print("Kelvin Temp   : ");
    Serial.print(k);
    Serial.print(" *K, ");
    Serial.println();
    Serial.print("Reamur Temp   : ");
    Serial.print(r);
    Serial.print(" *R, ");
    Serial.println();
    Serial.println("=============================");

  }
}
```

```
void setup()
{
  Serial.begin(115200);
  Serial.println("Simple DHT");
  pinMode(RED_LED, OUTPUT);
  pinMode(GREEN_LED, OUTPUT);
  pinMode(BLUE_LED, OUTPUT);
  delay(1000);
}

void loop()
{
  TemperatureCategory();
  Serial.println("");
  delay(4000);
}
```
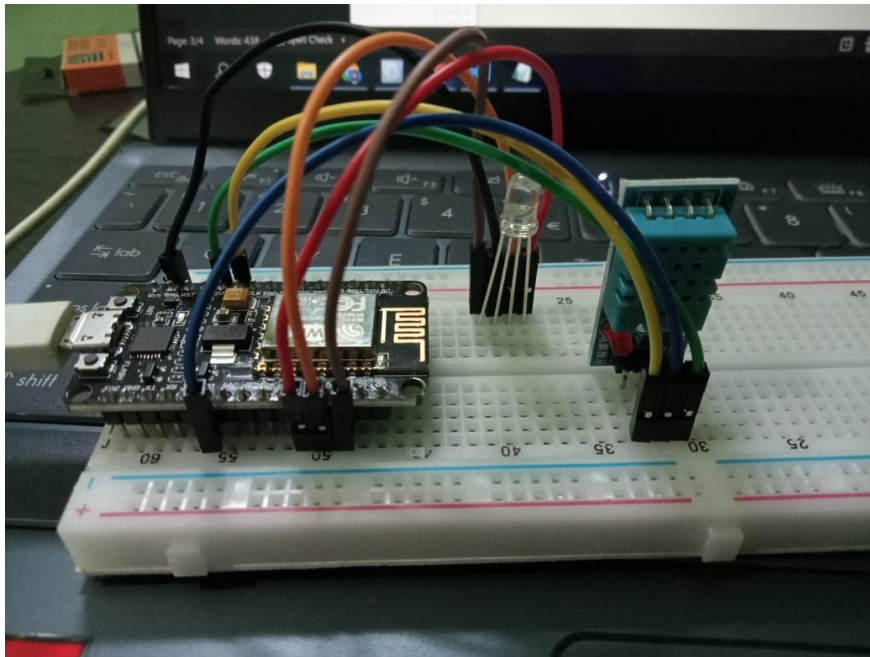
Result:
Serial Monitor:

```
Simple DHT
=================================
Temperatur    : Normal
LED           : GREEN
Celcius Temp  : 26.00 *C,
Kelvin Temp   : 299.15 *K,
Reamur Temp   : 20.80 *R,
=================================


=================================
Temperatur    : Normal
LED           : GREEN
Celcius Temp  : 26.00 *C,
Kelvin Temp   : 299.15 *K,
Reamur Temp   : 20.80 *R,
=================================


=================================
Temperatur    : Normal
LED           : GREEN
Celcius Temp  : 26.00 *C,
Kelvin Temp   : 299.15 *K,
Reamur Temp   : 20.80 *R,
```

Schema :

Explanation:
In task number 2, there is an IoT tool component that is added, namely the RGB LED which will light up at a certain temperature. In the program code the categories that I use are cold, normal, and hot. For the cold category, the temperature is <= 24*C where at this temperature the red led will light up, then for the medium temperature, namely >24*c to 37*C and the green LED will light up, and the last one for the hot temperature is >37 * C, the LED that will light up is blue.

3. Draw a schematic of the simulation you created.
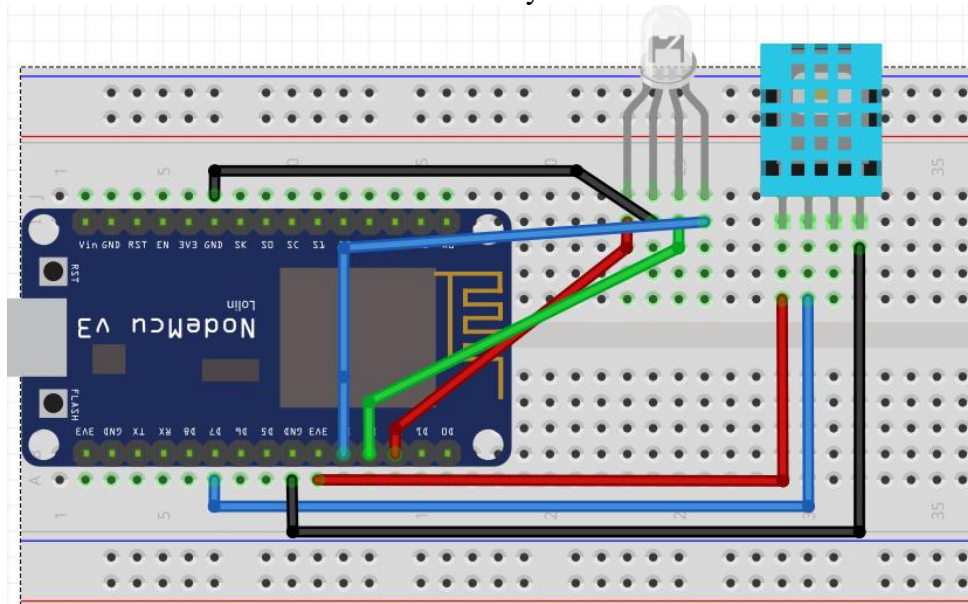
4. Please upload the results of the simulation on youtube and insert the url in your report.
   Video : https://youtu.be/C2rcM1LhN9A