Experiment 3 : Connect Arduino board with DHT11 Sensor to read the temperature and humidity of the current environment

Aim: The main aim of this experiment is to interface a sensor with the microcontroller and to read the temperature and humidity of the current environment

1. COMPONENTS REQUIRED

a) Arduino UNO
b) Breadboard
c) DHT11 Sensor
d) Jumper wires

a. ARDUINO UNO:

Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

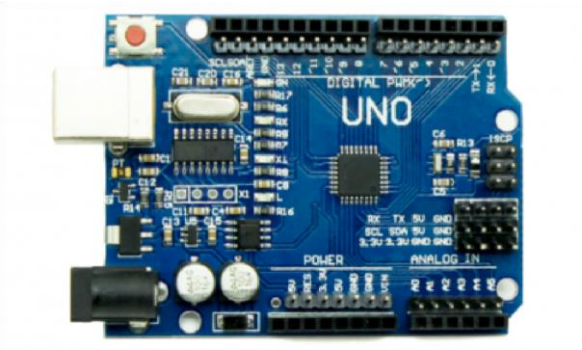


Figure 1.0 - Arduino UNO

b. BREADBOARD:

Breadboards are one of the most fundamental pieces when learning how to build circuits. Breadboards are commonly utilized while prototyping temporary circuits. It is useful to designers because it allows components to be removed and replaced easily.

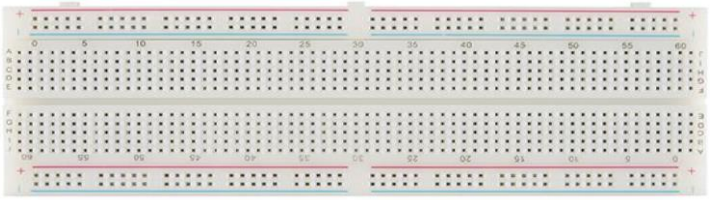
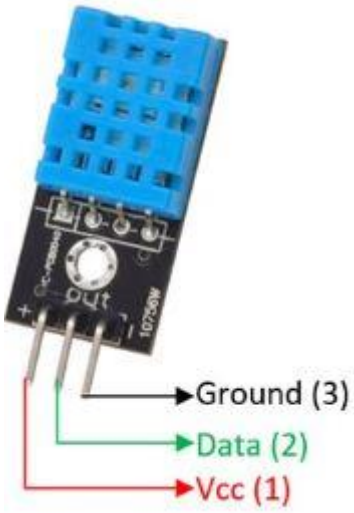


Figure 1.1 – Breadboard

DHT11 Sensor: The **DHT11** is a low-cost digital sensor used to measure **temperature and humidity**. It is widely used in weather monitoring and environmental sensing applications.

Pin Configuration:

1. **VCC** – Power supply (3.3V or 5V)
2. **Data** – Outputs digital signal
3. **GND** – Ground



2.SOFTWARE

Software is a generic term to refer to the scripts and programs that run on a microprocessor or microcontroller and execute specific tasks.

2.1 GET START WITH ARDUINO IDE

Follow the steps to install Arduino IDE:

Step 1: Browse for the URL - ' https://www.arduino.cc/en/software '

Step 2: In DOWNLOAD OPTIONS, choose Windows/Linux/Mac OS accordingly.

Step 3: Select - JUST DOWNLOAD. The download will start!

Step 4: Run the downloaded setup file.

Step 5. Goto Sketch-Include Library- Manage Librarys(ctr+shift+I) install DHT11 Software/ DFRobot_DHT11/Drivers

Step 6: Goto Files- Example -check DFRobot_DHT11- Select read DHT11 sample program – change boudrate to 9600

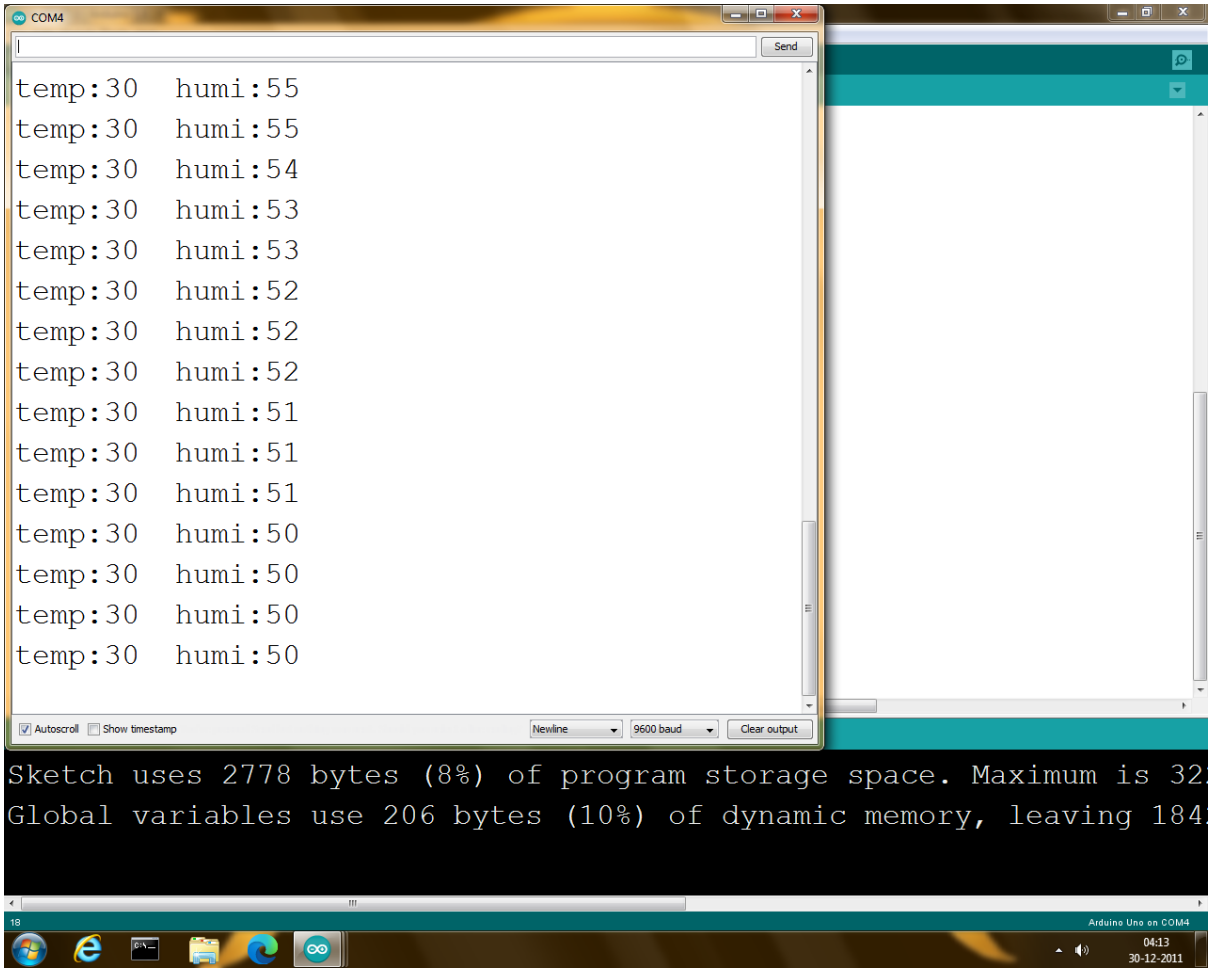
3. PROGRAM

```
//LED Blinking using DHT11 Sensor
//DHT11 is used to read the temperature and humidity of the current environment
//Circuit Digram-  DHT11 Out ----> to Uno 10
#include <DFRobot_DHT11.h>
DFRobot_DHT11 DHT;
#define DHT11_PIN 10

void setup(){
  Serial.begin(9600);
}

void loop(){
  DHT.read(DHT11_PIN);
  Serial.print("temp:");
  Serial.print(DHT.temperature);
  Serial.print("  humi:");
  Serial.println(DHT.humidity);
  delay(1000);
}
```

Output:



4. Results

DHT11 Sensor to read the temperature and humidity of the current environment using the microcontroller unit is successfully implemented.

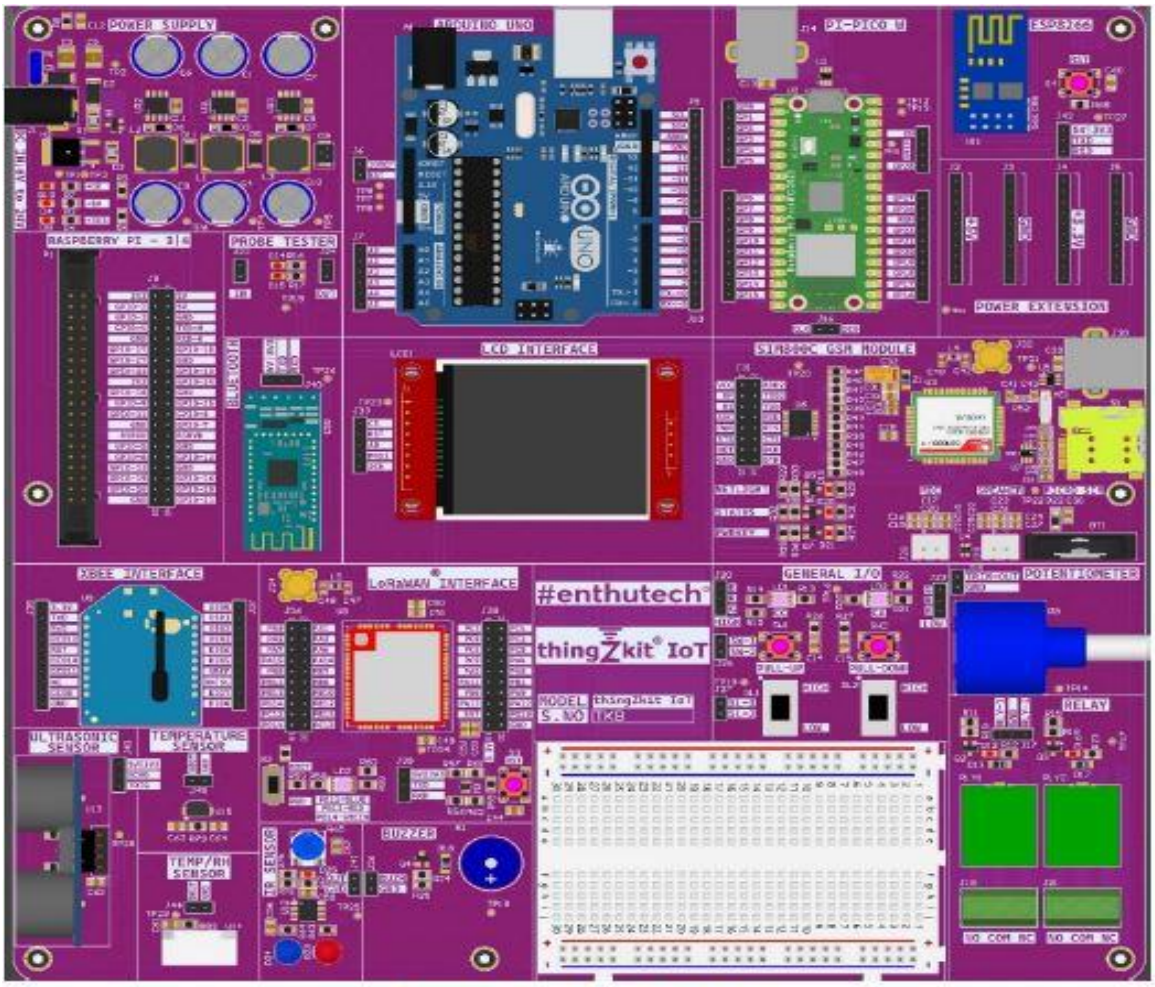


Fig. No 1: thingZkit IoT