East West University

Department of CSE

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Lab report: 01

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Introduction : DHT series (e.g. DHT11 and DHT22) DHT Series are inexpensive digital temperature and humidity readers. They are also user-friendly and thus perfect in hobby use and weather uses.

Code :

```
void setup(){
Serial.begin(9600);
}
void loop(){
int sensor=analogRead(A0);
sensor
Serial.println(sensor);
}
```

Sensor types and properties : DHT sensors have both humidity sensor and thermistor that complement each other to give precise measurements.

DHT11: Temperature Range - 0-50 C (32-122 F)
+/- 2o C (temperature) +/- 5% RH (humidity)
- Sampling Rate : 1 reading each one second
- Cost : Very low
DHT 22 (AM 2302) : Temperature Range: -40 to 80 C(-40 to 176 F)
Accuracy: 0.5 o C (temperature), 2-5 % RH (humidity)
Monitoring Frequency: 2 second per 1 reading
- Cost: It is more expensive than DHT11, but with more accuracy

Mechanics of It :

- Humidity Sensing : here the humidity sensor changes in resistance according to the amount of moisture of the air read and converted to a digital signal.

Temperature Sensing A thermistor has the property that its resistance decreases with the temperature which is also converted into a digital data.

- Digital Output: The output is conveyed by a contact free 1-wire connection to a micro-controller (e.g. Arduino).

Arduino connections Wiring: When dealing with a regular 3 pin DHT sensor:

- VCC: Arduino 5V.

- Data: Drives to a digital pin (e.g. Pin 2).

- GND: Ground on Arduino.

Pull-up Resistor: a steady 10K Ohm resistor Data to VCC is to be connected up via a stable pull-up.

Computer programs (Arduino Sketch): Adafruit DHT Sensor Library improves the processing of the data.

Libraries: Used include DHT.h and include Adafruit_Sensor.h.

- Setup: beginning a serial communication, Serial.begin(9600):

- dht.begin(): Initialises the sensor.

- Reading Data: Insert plug gaps of reading interval (12 sec).

-Use functions to obtain values of temperature and humidity.

-Evaluate (any) errors and compute the heat index.

-Write the answer to Serial Monitor.

Applications : DHT sensors have numerous projects to use including:

- Smart thermostats Home automation
Weather stations
- Greenhouses
HVAC systems
-Medical technology
- Studies on the environment

Conclusion : The humidity and temperature measurement of the DHT series of sensors simply makes it a cheap and easy alternative to measure these parameters in different projects. Environmental data is quite accessible, once one has the right wiring and code.