**SPRINT-4**

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| Team ID | PNT2022TMID46761 |
| Project Name | Real-Time River Water Quality Monitoring and Control System |

**CODE FOR ARDUINO**

#include <OneWire.h>

#include <DallasTemperature.h>

#define ONE\_WIRE\_BUS 5

OneWire oneWire(ONE\_WIRE\_BUS); DallasTemperature sensors(&oneWire); float Celcius=0; float Fahrenheit=0; float voltage=0; const int analogInPin = A0; int sensorValue = 0; unsigned long int avgValue; float b; int buf[10],temp; void setup(void)

{

Serial.begin(9600); sensors.begin(); int sensorValue = analogRead(A1); voltage = sensorValue \* (5.0 / 1024.0); } void loop(void)

{ sensors.requestTemperatures(); Celcius=sensors.getTempCByIndex(0); Fahrenheit=sensors.toFahrenheit(Celcius); for(int i=0;i<10;i++)

{ buf[i]=analogRead(analogInPin); delay(10); } for(int i=0;i<9;i++)

{ for(int j=i+1;j<10;j++)

{ if(buf[i]>buf[j]) { temp=buf[i]; buf[i]=buf[j]; buf[j]=temp;

}

} } for(int i=2;i<8;i++) avgValue+=buf[i]; float pHVol=(float)avgValue\*5.0/1024/6; float phValue = -5.70 \* pHVol + 21.34; Serial.println(phValue);

Serial.print("pH");

Serial.print(" C ");

Serial.print(Celcius);

Serial.print(voltage); Serial.print("V"); delay(10000);

}

**CODE IMPLEMENTATION**

import serial import time import csv import numpy as np import matplotlib.pyplot as plt ser = serial.Serial('/COM6',9600) ser\_bytes = ser.readline(10) print (ser\_bytes) ser.flushInput() while True: try:

ser\_bytes = ser.readline() decoded\_bytes = float(ser\_bytes[0:len(ser\_bytes)-2].decode("utf-8")) print(decoded\_bytes) temp = float(decoded\_bytes(1:3))

turb = float(decoded\_bytes(4:6)) pH = float(decoded\_bytes(6:8)) with open("test\_data.csv","a") as f: writer = csv.writer(f,delimiter=",") writer.writerow([time.time(),decoded\_bytes]) except: print("Keyboard Interrupt") ser.close() break()

t = np.arange(0.0, 2.0, 0.01) s = 1 + np.sin(2\*np.pi\*t) plt.plot(t, s) plt.xlabel('time (s)') plt.ylabel('Celsisus (C)') plt.title('Temperature') plt.grid(True) plt.savefig("Temperature.png") plt.show()

Serial.begin(9600); sensors.begin(); int sensorValue = analogRead(A1); voltage = sensorValue \* (5.0 / 1024.0);

} void loop(void)

{ sensors.requestTemperatures(); Celcius=sensors.getTempCByIndex(0); Fahrenheit=sensors.toFahrenheit(Celcius); for(int i=0;i<10;i++)

{ buf[i]=analogRead(analogInPin); delay(10); } for(int i=0;i<9;i++)

{ for(int j=i+1;j<10;j++)

{ if(buf[i]>buf[j])

{ temp=buf[i]; buf[i]=buf[j]; buf[j]=temp;

} n = 256

X = np.linspace(-np.pi, np.pi, 256, endpoint=True) C,S = np.cos(X), np.sin(X) plt.plot(X, C) plt.plot(X,S) plt.show() print ("Visualization of real time sensor Data.") print("/n") while True: try:

ser\_bytes = ser.readline()

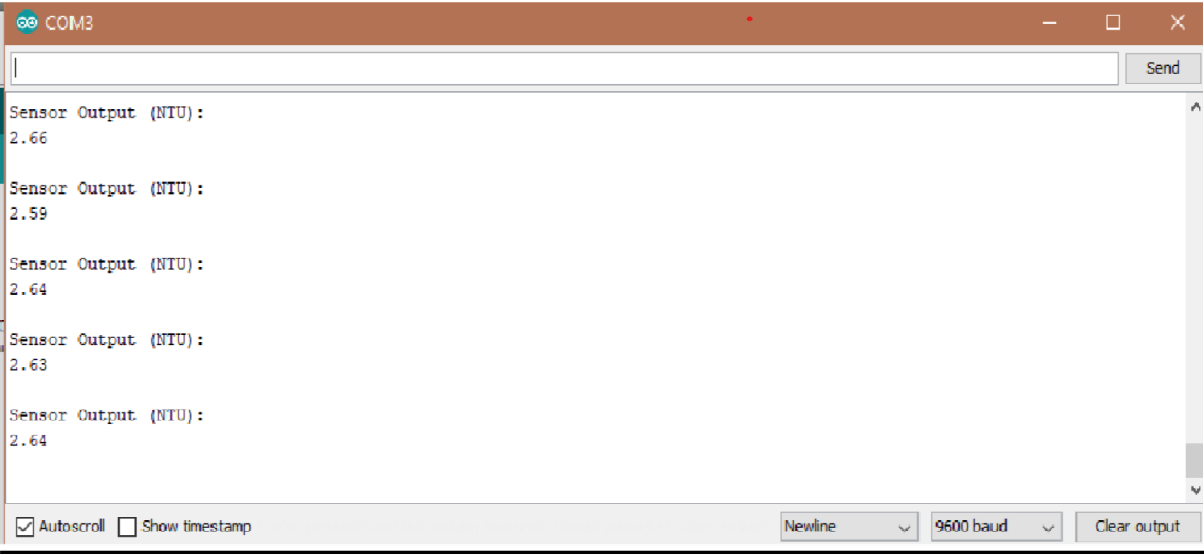
decoded\_bytes = float(ser\_bytes[0:len(ser\_bytes)-2].decode("utf-8")) print(decoded\_bytes)

temp = float(decoded\_bytes(1:3)) turb = float(decoded\_bytes(4:6)) pH = float(decoded\_bytes(6:8)) with open("test\_data.csv","a") as f: writer = csv.writer(f,delimiter=",") writer.writerow([time.time(),decoded\_bytes]) except: print("Keyboard Interrupt") ser.close() break()

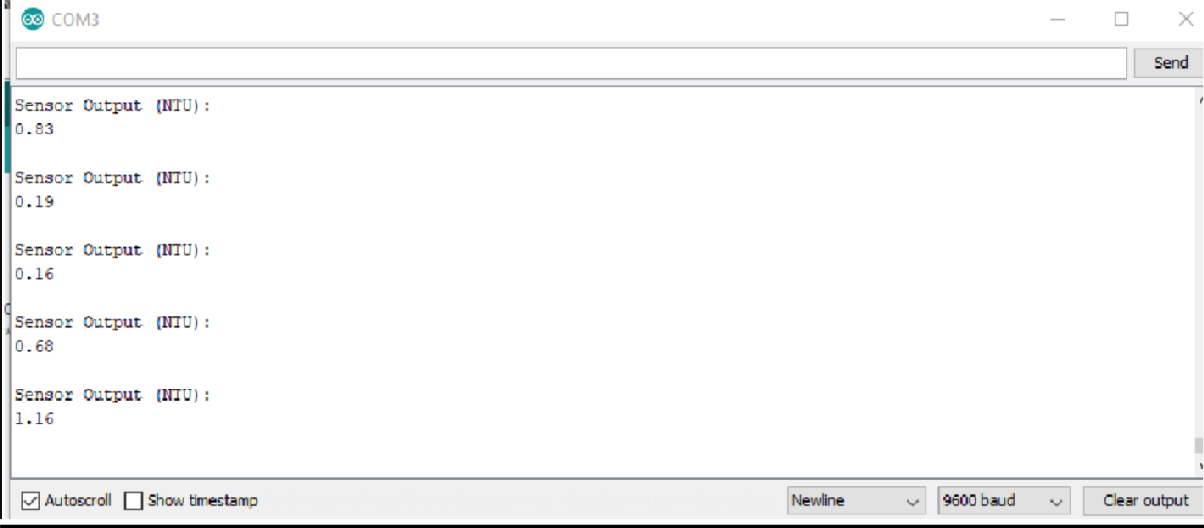
t = np.arange(0.0, 2.0, 0.01) s = 1 + np.sin(2\*np.pi\*t) plt.plot(t, s)

**OUTPUT:**

**TEST CASE 1:**



**TEST CASE 2:**



**FINAL OUTPUT:**

