

SPRINT 4

TEAM ID	PNT2022TMID21676
PROJECT TITLE	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(Celci
us); 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 for 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('Celsiusus
(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)

```



