

SPRINT-4

TEAM ID	PNT2022TMID12734
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('Celsius(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)

```

ARDUINO OUTPUT:



The image shows a screenshot of an Arduino IDE serial monitor window. The title bar at the top is brown and contains the text "COM3" next to a small icon. Below the title bar is a white text area with a vertical scrollbar on the right. The text area contains four lines of output, each consisting of a label "Sensor Output (NTU):" followed by a numerical value. The values are 2.66, 2.59, 2.64, and 2.62, appearing on separate lines.

```
COM3  
  
Sensor Output (NTU):  
2.66  
  
Sensor Output (NTU):  
2.59  
  
Sensor Output (NTU):  
2.64  
  
Sensor Output (NTU):  
2.62
```