PROJECT DEVELOPMENT PHASE
SPRINT - 4

TEAM ID	PNT2022TMID19330
PROJECT NAME	Project - Real time river water quality monitoring and control system
MAXIMUM MARKS	4

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)
```

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;
}
 }
```

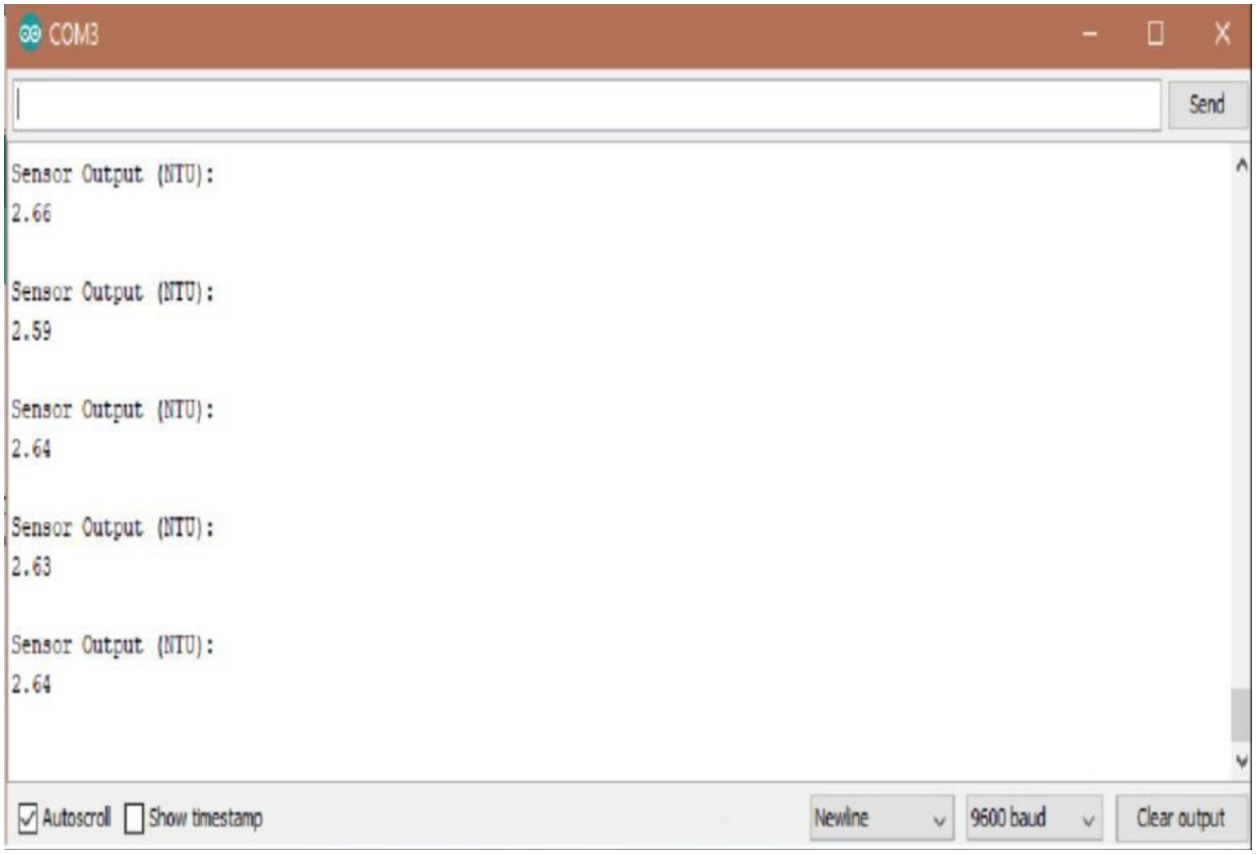
```
}
for(int i=2;i<8;i++)
avgValue+=buf[i];
float pHVol=(float)avgValue*5.0/1024/6;
float phValue = -5.70 * pHVol + 21.34;
Serial.println(phValue);
Serial.print("pH");



Serial.print(" C ");
Serial.print(Celcius);


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

ARDUINO OUTPUT


COM3
Send
Sensor Output (NTU):
2.66
Sensor Output (NTU):
2.59
Sensor Output (NTU):
2.64
Sensor Output (NTU):
2.63
Sensor Output (NTU):
2.64
Autoscroll
Show timestamp
Newline
9600 baud
Clear output