

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING****IBM NALAIYA THIRAN PROJECT****Preparation Phase**

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|---------------|--|
| Date | 20 September 2022 |
| Team ID | PNT2022TMID03479 |
| Project Name | IoT Based Smart Crop Protection System for Agriculture |
| Maximum Marks | 2 Marks |

Assignment 1:

Publish sensor parameters like Temperature, Humidity, and Soil Moisture to the IBM IoT platform. Solution :

```
#include <LiquidCrystal.h>
```

```
LiquidCrystal lcd(8,9,10,11,12,13);//rs,en,data pins d4 -d7
```

```
float TEMP;
```

```
int MOISURE,HUM;
```

```
const int buzzer=6;
```

```
const int motor=7;
```

```
int led=4,temp=0,i=0;
```

```
char str[30];
```

```
int aa=0, dt=0///temp;
```

```
int dh=0;//hum
```

```
int s1=0,s3=0;
```

```
void setup() {
```

```
lcd.begin(16,2);
```

```
Serial.begin(9600);
```

```
pinMode(buzzer, OUTPUT);
```

```
pinMode(motor, OUTPUT);
```

```
digitalWrite(buzzer, LOW);
```

```
digitalWrite(motor, LOW);
```

```
lcd.clear();
```

```
lcd.setCursor(0,0);lcd.print("IOT Based ");
```

```
lcd.setCursor(0,1);lcd.print("Agriculture Crop");
```

```
delay(5000);lcd.clear();
```

```
lcd.setCursor(0,0);lcd.print("Field Monitoring");
```

```
lcd.setCursor(0,1);lcd.print("Irrigation");
```

```
delay(5000);lcd.clear();
```

```
lcd.setCursor(0,0);lcd.print(" Automation");
```

```
lcd.setCursor(0,1);lcd.print("using GPRS ");
```

```

delay(5000);lcd.clear();

gsm_init();lcd.clear();

digitalWrite(buzzer, LOW);

digitalWrite(motor, LOW);

}

void loop() {

aa=aa+1;

digitalWrite(buzzer, LOW);

lcd.clear();

TEMP = analogRead(0);

TEMP=(TEMP*500)/1023;

lcd.setCursor(0,0);lcd.print("T:");lcd.setCursor(3,0);lcd.print(TEMP);delay(200);if(TEMP<50){dt=0;delay(100);}

if(TEMP>50){

dt=dt+1;

if(dt==2){

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);lcd.clear();send_gprs();delay(500);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

lcd.clear();lcd.setCursor(0,0);lcd.print("SENDING SMS");lcd.setCursor(0,1);lcd.print("TEMP ALERT");

Serial.println("AT+CMGF=1");delay(400);

Serial.println("AT+CMGS=\"9148300815\"");delay(400);

Serial.println("Over Temperature\n");delay(100);

Serial.print("Temp=");delay(100);Serial.print(TEMP);delay(500);Serial.write(26);delay(500);

Serial.print("AT\r\n");delay(1000);Serial.print("AT\r\n");delay(1000);Serial.println("AT+CMGF=1");delay(1000);

}}

HUM= analogRead(1);HUM =HUM/2;

HUM=HUM+12;

lcd.setCursor(0,1);lcd.print("H:");lcd.setCursor(3,1);lcd.print(HUM);delay(2500);if(HUM<30){dh=0;delay(100);}

if(HUM>45){

dh=dh+1;

if(dh==2){

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);lcd.clear();send_gprs();delay(500);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

lcd.clear();lcd.setCursor(0,0);lcd.print("SENDING SMS");lcd.setCursor(0,1);lcd.print("HUMIDITY ALERT");

Serial.println("AT+CMGF=1");delay(400);

Serial.println("AT+CMGS=\"9148300815\"");delay(400);

Serial.println("HUMIDITY ALERT\n");delay(100);

Serial.print("HUM=");delay(100);Serial.print(HUM);delay(500);Serial.write(26);delay(500);

Serial.print("AT\r\n");delay(1000);Serial.print("AT\r\n");delay(1000);Serial.println("AT+CMGF=1");delay(1000);

}}

MOISURE = analogRead(2); MOISURE= MOISURE/4;MOISURE=256-MOISURE;

lcd.setCursor(9,0);

```

```

lcd.print("M: ");

lcd.setCursor(11,0);

lcd.print(MOISURE);

delay(500);

if(MOISURE<100){

s1=s1+1;

if(s1==5){

s3=0;

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);lcd.clear();send_gprs();delay(500);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

lcd.clear();lcd.setCursor(0,0);lcd.print("SENDING SMS");delay(2000);

lcd.clear();

lcd.setCursor(0,0);lcd.print("FEILD AT DRY");

lcd.setCursor(0,1);lcd.print("MOTOR ON");delay(2000);

digitalWrite(motor, HIGH);

Serial.print("AT\r\n");delay(2000);Serial.print("AT\r\n");delay(2000);

Serial.println("AT+CMGF=1");delay(400);Serial.println("AT+CMGS=\\"9148300815\\");delay(400); // use your 10 digit cell no. here

Serial.println("FEILD AT DRY\n");delay(100);

Serial.println("MOTOR ON\n");delay(100);

Serial.write(26);delay(100);

Serial.print("AT\r\n");delay(1000);Serial.print("AT\r\n");delay(1000);Serial.println("AT+CMGF=1");delay(1000);

motor_gprs();

delay(2000);

pump_gprs();

delay(2000);

}

delay(100);

}

if(MOISURE>200){

s3=s3+1;

if(s3==5){

s1=0;

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);lcd.clear();send_gprs();delay(500);

delay(200);digitalWrite(buzzer, HIGH);delay(200);digitalWrite(buzzer, LOW);

lcd.clear();lcd.setCursor(0,0);lcd.print("SENDING SMS");delay(2000);

lcd.clear();

lcd.setCursor(0,0);lcd.print("FEILD AT WET");

lcd.setCursor(0,1);lcd.print("MOTOR OFF");delay(2000);digitalWrite(motor, LOW);

Serial.print("AT\r\n");delay(2000);Serial.print("AT\r\n");delay(2000);

Serial.println("AT+CMGF=1");delay(400);Serial.println("AT+CMGS=\\"9148300815\\");delay(400); // use your 10 digit cell no. here

Serial.println("FEILD AT WET\n");delay(100);

```

```

Serial.println("MOTOR OFF\n");delay(100);

Serial.write(26);delay(100);

Serial.print("AT\r\n");delay(1000);Serial.print("AT\r\n");delay(1000);Serial.println("AT+CMGF=1");delay(1000);

motor_gprs();

delay(2000);

pump_gprs();

delay(2000);

}

delay(100);

}

if(aa==10){

lcd.clear();

send_gprs();

delay(2000);

pump_gprs();

delay(2000);

aa=0;

}}

void motor_gprs(){

lcd.clear();lcd.print("GPRS SENDING");

boolean test47_flag=1;

while(test47_flag){Serial.print("AT+HTTTPARA=\ URL\","http://iotbabycare.com/iot_green_agrimnr/put_motor.php?mot=motor");

Serial.print("");Serial.print("\r\n");

while(Serial.available()>0){if(Serial.find("OK"))test47_flag=0;}delay(1000);}

lcd.clear();lcd.print("SENT COMPLETED");delay(10000);lcd.clear()

lcd.clear();lcd.print("ACTION");

boolean test48_flag=1;while(test48_flag){Serial.print("AT+HTTPACTION=0\r\n");

while(Serial.available()>0){if(Serial.find("OK"))test48_flag=0;}delay(1000);}

lcd.clear();lcd.print("SEND OK");delay(2000); delay(2000);delay(2000);

boolean at_flagd=1;while(at_flagd){Serial.println("AT");while(Serial.available()>0){if(Serial.find("OK"))at_flagd=0;}delay(1000);}

}

void send_gprs(){

lcd.clear();lcd.print("GPRS SENDING");

boolean test7_flag=1;

while(test7_flag){Serial.print("AT+HTTTPARA=\ URL\","http://iotbabycare.com/iot_green_agrimnr/put_data.php");

Serial.print("?temp=");Serial.print(TEMP);

Serial.print("&hum=");Serial.print(HUM);

Serial.print("&mos=");Serial.print(MOISURE);

Serial.print("");Serial.print("\r\n");

while(Serial.available()>0){if(Serial.find("OK"))test7_flag=0;}delay(1000);}

lcd.clear();lcd.print("SENT COMPLETED");delay(10000);lcd.clear();

lcd.clear();lcd.print("ACTION");

boolean test8_flag=1;while(test8_flag){Serial.print("AT+HTTPACTION=0\r\n");

```

```

while(Serial.available()>0){if(Serial.find("OK"))test8_flag=0;}delay(1000);}

lcd.clear();lcd.print("SEND OK");delay(2000); delay(2000);delay(2000);

}

void pump_gprs(){

boolean at_flagd=1;while(at_flagd){Serial.println("AT");while(Serial.available()>0){if(Serial.find("OK"))at_flagd=0;}delay(1000);}

lcd.clear();lcd.print("PING TO WEBSITE");

boolean
test17_flag=1;while(test17_flag){Serial.print("AT+HTTPPARA=\"URL\", \"http://iotbabycare.com/iot_green_agrimnr/get_data.php\");Serial.prin
t("\");Serial.print("\r\n");

while(Serial.available()>0){if(Serial.find("OK"))test17_flag=0;}delay(1000);}

lcd.clear();lcd.print("WEBLINK SUCESS");delay(1000);

lcd.clear();lcd.print("HTTP ACTION");

boolean test18_flag=1;while(test18_flag){Serial.print("AT+HTTPACTION=0\r\n");

while(Serial.available()>0){if(Serial.find("OK"))test18_flag=0;}delay(1000);}

lcd.clear();lcd.print("ACTION COMPLETED");delay(5000);

lcd.clear();lcd.print("GET THE DATA");

boolean test19_flag=1;while(test19_flag){Serial.print("AT+HTTPREAD\r\n");

SerialEvent();

while(Serial.available()>0){if(Serial.find("OK"))test19_flag=0;}delay(1000);}

lcd.clear();lcd.print("DATA OK");delay(5000);

if(temp==1){

check();

temp=0;

i=0;

delay(100);

}}

void SerialEvent() {

while(Serial.available()) {

if(Serial.find("?ID=")){

digitalWrite(led, HIGH);

delay(100);

digitalWrite(led, LOW);

while (Serial.available()) {

char inChar=Serial.read();

str[i++]=inChar;

if(inChar=='$'){

temp=1;

return;

} } } }

}

void check(){

if(!(strcmp(str,"ON",2))){lcd.setCursor(1,1);lcd.print("MOTOR ON");delay(500);digitalWrite(motor,HIGH);}

else if(!(strcmp(str,"OFF",3))){lcd.setCursor(1,1);lcd.print("MOTOR OFF");digitalWrite(motor,LOW);}

}

```

```

void gsm_init(){

lcd.clear();lcd.print("GSM TESTING..");

boolean at_flag=1;while(at_flag){Serial.println("AT");while(Serial.available()>0){if(Serial.find("OK"))at_flag=0;}delay(1000);}

lcd.clear();lcd.print("GSM CONNECTED");delay(1000);lcd.clear();

lcd.print("ECHO");

boolean echo_flag=1;

while(echo_flag)

{Serial.println("ATE0"); while(Serial.available()>0){if(Serial.find("OK"))echo_flag=0;}delay(1000);}

lcd.clear(); lcd.print("Echo OFF");delay(1000);lcd.clear();

lcd.print("Finding Network..");

boolean net_flag=1;while(net_flag){Serial.println("AT+CPIN?");

while(Serial.available()>0){if(Serial.find("+CPIN: READY"))net_flag=0;}delay(1000);}

lcd.clear();lcd.print("Network Found..");

lcd.setCursor(0,1);lcd.print("GSM NETWORK OK");delay(2000);lcd.clear();

lcd.clear();lcd.print("TEST MESS");

boolean test_flag=1;while(test_flag){Serial.println("AT+CMGF=1");

while(Serial.available()>0){if(Serial.find("OK"))test_flag=0;}delay(1000);}

lcd.clear();lcd.print("TEST MESSAGE");delay(1000);

lcd.clear();lcd.print("AT+CGATT");

boolean test1_flag=1;while(test1_flag){Serial.println("AT+CGATT=1");

while(Serial.available()>0){if(Serial.find("OK"))test1_flag=0;}delay(1000);}

lcd.clear();lcd.print("AT+CGATT=1");delay(1000);

lcd.clear();lcd.print("GPRS START");

boolean test2_flag=1;while(test2_flag){Serial.print("AT+SAPBR=3,1,\"CONTYPE\",\"GPRS\"\\r\\n");

while(Serial.available()>0){if(Serial.find("OK"))test2_flag=0;}delay(1000);}

lcd.clear();lcd.print("GPRS START1");delay(1000);

lcd.clear();lcd.print("GPRS START");

boolean test3_flag=1;while(test3_flag){Serial.print("AT+SAPBR=3,1,\"APN\",\"internet\"\\r\\n");

while(Serial.available()>0){if(Serial.find("OK"))test3_flag=0;}delay(1000);}

lcd.clear();lcd.print("GPRS START2");delay(1000);

lcd.clear();lcd.print("GPRS MAIN");

boolean test4_flag=1;while(test4_flag){Serial.print("AT+SAPBR=1,1\\r\\n");

while(Serial.available()>0){if(Serial.find("OK"))test4_flag=0;}delay(1000);}

lcd.clear();lcd.print("GPRS FIND");delay(1000);

lcd.clear();lcd.print("HTTP STARTS");

boolean test5_flag=1;while(test5_flag){Serial.print("AT+HTTPIPINIT\\r\\n");

while(Serial.available()>0){if(Serial.find("OK"))test5_flag=0;}delay(1000);}

lcd.clear();lcd.print("HTTP STARTS1");delay(1000);

lcd.clear();lcd.print("HTTP STARTS");

boolean test6_flag=1;while(test6_flag){Serial.print("AT+HTTTPARA=\\\"CID\\\",1\\r\\n");

while(Serial.available()>0){if(Serial.find("OK"))test6_flag=0;}delay(1000);}

lcd.clear();lcd.print("HTTP STARTS2");delay(1000);

}

```