SAVEETHA ENGINEERING COLLEGE AUTONOMOUS

Approved by AICTE | Affiliated to Anna University

TNEA CODE 1216

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

IBM NALAIYA THIRAN PROJECT

Project Development Phase

Date	21 October 2022
Team ID	PNT2022TMID03552
Project Name	IoT Based Smart Crop Protection System for Agriculture
Maximum Marks	8 Marks

Sprint 1:

To publish and access sensor parameters like Temperature, Humidity, and Soil Moisture to the IBM IoT platform.

Solution C++ Coding:

```
#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+HTTPPARA=\"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+HTTPPARA=\"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");

SeriallEvent();

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 SeriallEvent() {

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

else if(!(strncmp(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+HTTPINIT\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+HTTPPARA=\"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);}
```