CHAPTER 4

EXPERIMENTAL ANALYSIS

4.1 SYSTEM CONFIGURATION

4.1.1 Software requirements

- **Firstly library files has to be included for the sensors**

```
/*Weather monitoring system with Thing speak.
  Created by the SriTu Hobby team.
  http://srituhobby.com
*/

#include <SFE_BMP180.h>
#include <Wire.h>
#include <ESP8266WiFi.h>
#include "DHT.h"
```

- **Secondly, objects and variables are created for these libraries.**

```
DHT dht(D3, DHT11);
SFE_BMP180 bmp;
double T, P;
char status;
WiFiClient client;
```

- **Thirdly, let's include the apiKey and WI-FI connection details.**

```
String apiKey = "0AKC9Y6NSYAB0DHE";
const char *ssid =  "Nooby";
const char *pass =  "nirmalnaveen";
const char* server = "api.thingspeak.com";
```

- **In the setup function,**

```
void setup() {
Serial.begin(115200);
delay(10);
 bmp.begin();
 Wire.begin();
 dht.begin();
 WiFi.begin(ssid, pass);


 while (WiFi.status() != WL_CONNECTED) {
   delay(500);
   Serial.print(".");
 }
 Serial.println("");
 Serial.println("WiFi connected");
}
```

- **The loop function includes all the main functions. These are described below.**

```
void loop() {
 //BMP180 sensor
 status = bmp.startTemperature();
 if (status != 0) {
   delay(status);
   status = bmp.getTemperature(T);
```

```
  status = bmp.startPressure(3);// 0 to 3
  if (status != 0) {
    delay(status);
    status = bmp.getPressure(P, T);
    if (status != 0) {

    }
  }
}

//DHT11 sensor
float h = dht.readHumidity();
float t = dht.readTemperature();

if (isnan(h) || isnan(t)) {
  Serial.println("Failed to read from DHT sensor!");
  return;
}

//Rain sensor
int r = analogRead(A0);
r = map(r, 0, 1024, 0, 100);


if (client.connect(server, 80)) {
  String postStr = apiKey;
  postStr += "&field1=";
  postStr += String(t);
  postStr += "&field2=";
  postStr += String(h);
  postStr += "&field3=";
```

```
postStr        +=
String(P,      2);
postStr        +=
"&field4=";
postStr        +=
String(r);
postStr += "\r\n\r\n\r\n\r\n";

client.print("POST             /update
HTTP/1.1\n");   client.print("Host:
api.thingspeak.com\n");
client.print("Connection:
close\n");
client.print("X-THINGSPEAKAPIKEY: " + apiKey + "\n");
client.print("Content-Type: application/x-www-form-
urlencoded\n");client.print("Content-Length: ");
client.print(postStr.length());
client.print("\n\n\n\n");
client.print(postStr);

Serial.print("Temperature
: "); Serial.println(t);
Serial.print("Humidity:
"); Serial.println(h);
Serial.print("absolute
pressure: ");Serial.print(P,
2); Serial.println("mb");
Serial.print("Rain");
Serial.println(r);

}
```

```
  clie
  nt.st
  op()
  ;
  dela
  y(10
  00);
}
```