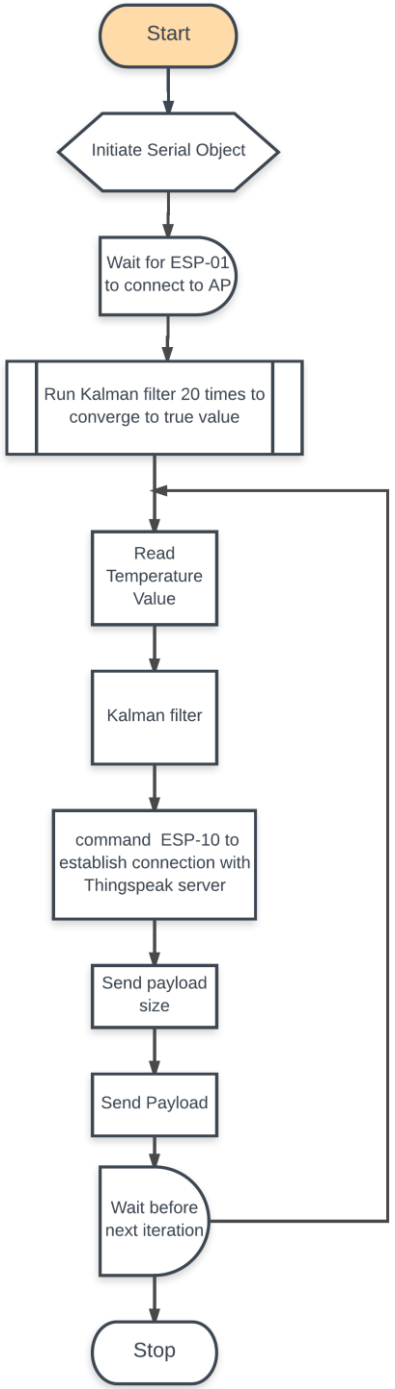
Program

Explain

Flow Chart


Start
Initiate Serial Object
Wait for ESP-01 to connect to AP
Run Kalman filter 20 times to converge to true value
Read Temperature Value
Kalman filter
command ESP-10 to establish connection with Thingspeak server
Send payload size
Send Payload
Wait before next iteration
Stop

Code

```
#include "Filters/kalman.h"
#include "config.h"


uint16_t temperatureRaw;
uint8_t temperature;
uint8_t i;

void setup() {

    Serial.begin(115200);
    delay(INIT_DELAY);      // Wait for ESP-01 to connect with an access point

    // Converge the kalman filter at startup
    for (i=0; i<20; i++) {
        temperatureRaw = (analogRead(A0) >> 1);     // Devide the value by 2 to get the acctual temperature in Celcius
        temperature = kalmanFilter(temperatureRaw); // Apply kalman filter to smoothen out the values
        delay(100);
    }
}

void loop() {
    // Get Raw Temperature sensor(LM35) data from ADC
    temperatureRaw = (analogRead(A0) >> 1);     // Devide the value by 2 to get the acctual temperature in Celcius
    temperature = kalmanFilter(temperatureRaw); // Apply kalman filter to smoothen out the values


    // Connect and send payload to thingspeak server
    Serial.println(TS_connect);
    delay(2000);
    Serial.println(TS_size);
    delay(2000);
    Serial.print(TS_payload);
    if(temperature < 10) {
        Serial.print('0');
    }
    Serial.println(temperature);

    // Wait between each push
    delay(INTERVAL);
}
```

config.h

Establish Connection with Thingspeak Server

Declare Payload size (i.e. 74 bytes)

Payload without the temp. value

```
2  /********************************* Thing Speak GET Connection ********************************/
3  char TS_connect[] = "AT+CIPSTART=\"TCP\",\"api.thingspeak.com\",80";
4  char TS_size[] = "AT+CIPSEND=74";
5  char TS_payload[] = "GET https://api.thingspeak.com/update?api_key=D4SUXF8GPW96TGD8&field1=";
6
7
8
9  /*********************************** Initial Delay ***********************************/
10 #define INIT_DELAY 10000    // delay in mili second
11
12
13 /*********************************** Interval Delay **********************************/
14 #define INTERVAL 10000      // delay in mili second
```

Chanel Key