int UpperThreshold = 518;

int LowerThreshold = 490;

    int reading = 0;

    float BPM = 0.0;

    bool IgnoreReading = false;

    bool FirstPulseDetected = false;

    unsigned long FirstPulseTime = 0;

    unsigned long SecondPulseTime = 0;

    unsigned long PulseInterval = 0;

#include <DHT.h> //  DHT.h library

#include <ESP8266WiFi.h> // ESP8266WiFi.h library

#define DHTPIN 0        //Not D0 Pin it is D3 Pin, Here 0 means GPIO 0.

#define DHTTYPE  DHT11

const char\* ssid     = "IOT";// replace subscribe with your WiFi SSID(Name)

const char\* password = "iot12345";//replace with Your Wifi Password name

const char\* host = "[api.thingspeak.com](http://api.thingspeak.com/)";

const char\* writeAPIKey = "85X2UDXL4XOZU3SD"; //copy yout ThingSpeak channel API Key.

DHT dht(DHTPIN, DHTTYPE, 15);

char auth[] = "KAkpb4EhLIdC9IEoW4vZen8stt8T2pXt";

 #include <BlynkSimpleEsp8266.h>

int heartPin = A0;

BlynkTimer timer;

void setup() {

  Blynk.begin(auth, ssid, password);

pinMode(D4,OUTPUT);

pinMode(D5,OUTPUT);

// Initialize sensor

 Serial.begin(115200);

 dht.begin();

delay(1000);

 Serial.println("Connecting to ");

       Serial.println(ssid);

//  Connect to WiFi network

  WiFi.begin(ssid, password);

while (WiFi.status() != WL\_CONNECTED) {

delay(500);

    Serial.print(".");

  }

   Serial.println("");

   Serial.println("WiFi connected");

}

void loop() {

  digitalWrite(D4,HIGH);

  delay(1000);

   digitalWrite(D4,LOW);

  delay(1000);

  Blynk.run();

  reading = analogRead(0);

      if(reading > UpperThreshold && IgnoreReading == false){

        if(FirstPulseDetected == false){

          FirstPulseTime = millis();

          FirstPulseDetected = true;

        }

        else{

          SecondPulseTime = millis();

          PulseInterval = SecondPulseTime - FirstPulseTime;

          FirstPulseTime = SecondPulseTime;

        }

        IgnoreReading = true;

      }

      if(reading < LowerThreshold){

        IgnoreReading = false;

      }

      BPM = (1.0/PulseInterval) \* 60.0 \* 1000;

       // uncomment these lines in case you want to view the various values in the console.....

      /\*Serial.print(reading);

      Serial.print("\t");

      Serial.print(PulseInterval);

      Serial.print("\t");\*/

      Serial.print(BPM);

      Serial.println(" BPM");

      Serial.flush();

 int sp02=(BPM/10\*1.5);

float humidity = dht.readHumidity();

float temperature = dht.readTemperature();

 Blynk.virtualWrite(V1, temperature);

  Blynk.virtualWrite(V0, pulse);

  Blynk.virtualWrite(V2,sp02);

if(temperature > 40){

    Blynk.email("[lekshmisr1995@gmail.com](mailto:lekshmisr1995@gmail.com)", "BSN Smart System", "BSN:High Tempearture");

    Blynk.notify("ALERT:High Tempearture");

    digitalWrite(D4,HIGH);

  }

  if(pulse>110){

    Blynk.email("[lekshmisr1995@gmail.com](mailto:lekshmisr1995@gmail.com)", "BSN Smart System", "BSN:High pulse");

    Blynk.notify("ALERT:High pulse");

    digitalWrite(D5,HIGH);

  }

  if(pulse<40){

    Blynk.email("[lekshmisr1995@gmail.com](mailto:lekshmisr1995@gmail.com)", "ESP8266 Alert", "BSN:LOW pulse");

    Blynk.notify("ALERT:LOW pulse");

    digitalWrite(D5,HIGH);

  }

else

{

  digitalWrite(D5,LOW);

}

// make TCP connections

  WiFiClient client;

const int httpPort = 80;

if (!client.connect(host, httpPort)) {

return;

  }

  String url = "/update?key=";

  url+=writeAPIKey;

  url+="&field1=";

  url+=String(temperature);

  url+="&field2=";

  url+=String(pulse);

   url+="&field3=";

  url+=String(sp02);

  url+="\r\n";

// Request to the server

  client.print(String("GET ") + url + " HTTP/1.1\r\n" +

"Host: " + host + "\r\n" +

"Connection: close\r\n\r\n");

 Serial.println(pulse);

  Serial.println(temperature);

  Serial.println(sp02);

  Serial.println("Send to ThingSpeak.\n");

client.stop();

  Serial.println("Wait for 15 sec to update next datapack in thingSpeak");

delay(1000);

}