**APPENDIX – 1**

**Arduino Code**

int aPin135 = A5;

int aPin9 = A4;

int aIn135;

int aIn9;

int buzzer = 2;

void setup() {

pinMode(aPin9, INPUT);

pinMode(aPin135, INPUT);

pinMode(buzzer, OUTPUT);

Serial.begin(9600);

}

void loop() {

// put your main code here, to run repeatedly:

aIn9 = analogRead(aPin9);

aIn135 = analogRead(aPin135);

Serial.print("\'");

Serial.print(aIn9);

Serial.print("\', \'");

Serial.print(aIn135);

Serial.println("'");

if(aIn9 > 400 || aIn135 > 250){

digitalWrite(buzzer, HIGH);

}

else{

digitalWrite(buzzer, LOW);

}

delay(1000);

}

**sssssss**

**Sending Message- JAVA**

package view;

import java.io.BufferedReader;

import java.io.InputStreamReader;

import java.io.OutputStreamWriter;

import java.net.URL;

import java.net.URLConnection;

import java.net.URLEncoder;

public class communication {

public String communicate(String msg) {

try {

// Construct data

String user = "username=" + URLEncoder.encode("15euit003@skcet.ac.in", "UTF-8");

String hash = "&hash=" + URLEncoder.encode("16ebf2d7fccfd3823d68b4fddd3c4c94ccd1d8a2149339dec8d5b85cf5902ce5", "UTF-8");

String message = "&message=" + URLEncoder.encode(msg, "UTF-8");

String sender = "&sender=" + URLEncoder.encode("", "UTF-8");

String numbers = "&numbers=" + URLEncoder.encode("9655978734", "UTF-8");

// Send data

String data = "http://api.textlocal.in/send/?" + user + hash + numbers + message + sender;

URL url = new URL(data);

URLConnection conn = url.openConnection();

conn.setDoOutput(true);

// Get the response

BufferedReader rd = new BufferedReader(new InputStreamReader(conn.getInputStream()));

String line;

String sResult="";

while ((line = rd.readLine()) != null) {

// Process line...

sResult=sResult+line+" ";

}

rd.close();

return sResult;

} catch (Exception e) {

System.out.println("Error SMS "+e);

return "Error "+e;

}

}

}

**SERIAL CONNECTION-PYTHON**

import serial #Import Serial Library

import MySQLdb as sql

db = sql.connect("localhost", "root", "", "testing")

cursor = db.cursor()

arduinoSerialData = serial.Serial('com4',9600) #Create Serial port object called arduinoSerialData

i = 0

while (1==1):

if (arduinoSerialData.inWaiting()>0):

myData = arduinoSerialData.readline()

print myData

try:

query = "insert into pollution (sensor1, sensor2) values("+myData+")"

cursor.execute(query)

db.commit()

except:

db.rollback()

i = i+1

print i

if(i>10):

break

query = "select \* from pollution"

cursor.execute(query)

result = cursor.fetchall()

for r in result:

print r

db.close()

**DASHBOARD**

<!DOCTYPE html>

<html lang=“en”>

<head>

<meta charset=“utf-8\/>

<style>

#myProgress {

width: 100%;

background-color: grey;

}

#myBar {

width: 0%;

height : 25px;

background-color: green;

}

</style>

<style>

.button {

background-color: #4CAF50; /\* Green \*/

border: none;

color: white;

padding: 15px 32px;

text-align: center;

text-decoration: none;

display: inline-block;

font-size: 16px;

margin: 4px 2px;

cursor: pointer;

}

.button2 {

background-color: white;

color: black;

border: 2px solid #008CBA;

}

#myProgress1 {

width: 100%;

background-color: grey;

}

#myBar1 {

width: 0%;

height: 25px;

background-color: green;

}

</style>

<link rel=“apple-touch-icon\sizes=“76x76\href=“../assets/img/apple-icon.png”>

<link rel=“icon\type=“image/png\href=“../assets/img/favicon.ico”>

<meta http-equiv=“X-UA-Compatible\content=“IE=edge,chrome=1\/>

<title>Pavan-An Automated Air Pollution Monitoring System</title>

<meta content='width=device-width, initial-scale=1.0, maximum-scale=1.0, user-scalable=0, shrink-to-fit=no' name='viewport' />

<!-- Fonts and icons -->

<link href=“https://fonts.googleapis.com/css?family=Montserrat:400,700,200\rel=“stylesheet\/>

<link rel=“stylesheet\href=“https://www.w3schools.com/w3css/4/w3.css”>

<link rel=“stylesheet\href=“https://maxcdn.bootstrapcdn.com/font-awesome/latest/css/font-awesome.min.css\/>

<!-- CSS Files -->

<link href=“./assets/css/bootstrap.min.css\rel=“stylesheet\/>

<link href=“./assets/css/light-bootstrap-dashboard.css?v=2.0.1\rel=“stylesheet\/>

<!-- CSS Just for demo purpose, don't include it in your project -->

<link href=“./assets/css/demo.css\rel=“stylesheet\/>\n<script>

window.onload = function () {

var chart = new CanvasJS.Chart(“chartContainer”, {

animationEnabled: true,

theme: “light2”,

title:{

text: “MQ - 9”

},

axisX:{

valueFormatString: “##:##:##”,

crosshair: {

enabled: true,

snapToDataPoint: true

}

},

axisY: {

title: “Voltage”,

crosshair: {

enabled: true

}

},

toolTip:{

shared:true

},

legend:{

cursor:”pointer”,

verticalAlign: “bottom”,

horizontalAlign: “left”,

dockInsidePlotArea: true,

itemclick: toogleDataSeries

},

data: [{

type: “line”,

showInLegend: true,

name: “Sensor Reading”,

+ "xValueFormatString: “##:##:##”,

markerType: “square”,

color: “#F08080”,

dataPoints: [

{ x: "+date[0]+", y: "+s1[0]+},

{ x: "+date[1]+", y: "+s1[1]+},

{ x: "+date[2]+", y: "+s1[2]+},

{ x: "+date[3]+", y: "+s1[3]+},

{ x: "+date[4]+", y: "+s1[4]+},

{ x: "+date[5]+", y: "+s1[5]+},

{ x: "+date[6]+", y: "+s1[6]+},

{ x: "+date[7]+", y: "+s1[7]+},

{ x: "+date[8]+", y: "+s1[8]+},

{ x: "+date[9]+", y: "+s1[9]+}

]

},

{

type: “line”,

showInLegend: true,

name: “Threshold Reading”,

lineDashType: “dash”,

dataPoints: [

{ x: "+date[0]+", y: 350 },

{ x: "+date[1]+", y: 350 },

{ x: "+date[2]+", y: 350 },

{ x: "+date[3]+", y: 350 },

{ x: "+date[4]+", y: 350 },

{ x: "+date[5]+", y: 350 },

{ x: "+date[6]+", y: 350 },

{ x: "+date[7]+", y: 350 },

{ x: "+date[8]+", y: 350 },

{ x: "+date[9]+", y: 350 }

]

}]

);

chart.render();

function toogleDataSeries(e){

if (typeof(e.dataSeries.visible) === “undefined\|| e.dataSeries.visible) {

e.dataSeries.visible = false;

} else{

e.dataSeries.visible = true;

}

chart.render();

}

var chart1 = new CanvasJS.Chart(“chartContainer1”, {

animationEnabled: true,

theme: “light2”,

title:{

text: “MQ - 135”

},

axisX:{

valueFormatString: “##:##:##”,

crosshair: {

enabled: true,

snapToDataPoint: true

}

},

axisY: {

title: “Voltage”,

crosshair: {

enabled: true

}

},

toolTip:{

shared:true

},

legend:{

cursor:”pointer”,

verticalAlign: “bottom”,

horizontalAlign: “left”,

dockInsidePlotArea: true,

itemclick: toogleDataSeries1

},

data: [{

type: “line”,

showInLegend: true,

name: “Sensor Reading”,\n"

xValueFormatString: “##:##:##”,

markerType: “square”,

color: “#F08080”,

dataPoints: [

{ x: "+date[0]+", y: "+s2[0]+},

{ x: "+date[1]+", y: "+s2[1]+},

{ x: "+date[2]+", y: "+s2[2]+},

{ x: "+date[3]+", y: "+s2[3]+},

{ x: "+date[4]+", y: "+s2[4]+},

{ x: "+date[5]+", y: "+s2[5]+},

{ x: "+date[6]+", y: "+s2[6]+},

{ x: "+date[7]+", y: "+s2[7]+},

{ x: "+date[8]+", y: "+s2[8]+},

{ x: "+date[9]+", y: "+s2[9]+}

]

},

{

type: “line”,

showInLegend: true,

name: “Ideal Reading”,

lineDashType: “dash”,

dataPoints: [

{ x: "+date[0]+", y: 200 },

{ x: "+date[1]+", y: 200 },

{ x: "+date[2]+", y: 200 },

{ x: "+date[3]+", y: 200 },

{ x: "+date[4]+", y: 200 },

{ x: "+date[5]+", y: 200 },

{ x: "+date[6]+", y: 200 },

{ x: "+date[7]+", y: 200 },

{ x: "+date[8]+", y: 200 },

{ x: "+date[9]+", y: 200 }

]

}]

});

chart1.render();

function toogleDataSeries1(e){

if (typeof(e.dataSeries.visible) === “undefined\|| e.dataSeries.visible) {

e.dataSeries.visible = false;

} else{

e.dataSeries.visible = true;

}

chart1.render();

}

}

</script>

</head>

<body>

<div class=“wrapper”>

<div class=“sidebar\data-image=“../assets/img/sidebar-5.jpg”>

<div class=“sidebar-wrapper”>

<div class=“logo”>

Pavan

</div>

<ul class=“nav”>

<li>

<a class=“nav-link” href=“dashboard”>

<i class=“nc-icon nc-chart-pie-35”></i>

<p>Dashboard</p>

</a>

</li>

<li class=“nav-item active”>

<a class=“nav-link\href=“pollutionlevel”>

<i class=“nc-icon nc-circle-09”></i>

<p>Pollution Levels</p>

</a>

</li>

</ul>

</div>

</div>

<div class=“main-panel”>

<!-- Navbar -->

<nav class=“navbar navbar-expand-lg \color-on-scroll=“500”>

<div class=\container-fluid “>

<a class=“navbar-brand\href=“#pablo”> Pollution Levels </a>

<button href=“\class=“navbar-toggler navbar-toggler-right\type=“button\data-toggle=“collapse\aria-controls=“navigation-index\aria-expanded=“false\aria-label=“Toggle navigation”>

<span class=“navbar-toggler-bar burger-lines”></span>

<span class=“navbar-toggler-bar burger-lines”></span>

<span class=“navbar-toggler-bar burger-lines”></span>

</button>

<div class=“collapse navbar-collapse justify-content-end\id=“navigation”>

<ul class=“nav navbar-nav mr-auto”>

<li class=“nav-item”>

<a href=“#\class=“nav-link\data-toggle=“dropdown”>

<i class=“nc-icon nc-palette”></i>

<span class=“d-lg-none”>Dashboard</span>

</a>

</li>

</ul>

</div>

</div>

</nav>

<br/>

<br/>

<br/>

<br/>

<div class=“content”>

<div class=“container-fluid”>

<div class=“row”>

<div class=“col-md-4”>

<div class=“card “>

<div class=“card-header “>

MQ-9 Reading

</div>

<div class = “container\>

<div class=“progress\ >

<div id=“myBar\class = “bar bar-success”></div>

</div>

</div>

<p><div style = “height:35px;width:200px;<button class=“w3-button w3-white w3-border w3-border-blue\onclick=“move()”>Get Recent Reading</button>"

</div>

</p><br/><br/><br/>

</div><label id=“theLabel1”>

Suggestion:<br/>

</label>

</div>

<div class=“col-md-8”>

<div class =“card”>

<div class =“card-header”>

MQ - 9 24/7 Surveillance

</div>

<div class = “container”>

<div id=“chartContainer\style=“height: 370px; width: 100%;”>

</div>

<script src=“https://canvasjs.com/assets/script/canvasjs.min.js”></script>

</div>

</div>

</div>

<div class=“col-md-4”>

<div class=“card “>

<div class=“card-header “>

MQ-135 Reading

</div>

<div class = “container”>

<div class=“progress”> <div id=“myBar1\class=“bar bar-success”></div>

</div>

</div><br/><br/>

<p><div style = “height:35px;width:200px;”>"

</div>

</p><br/><br/><br/>

</div>

</div>

<div class=“col-md-8”>

<div class =“card”>

<div class =“card-header”>

MQ - 135 24/7 Surveillance

</div>

<div class = “container”>

<div id=“chartContainer1\style=“height: 370px; width: 100%;”>

</div>

<script src=“https://canvasjs.com/assets/script/canvasjs.min.js”></script>

</div>

</div>

</div>

</div>

<footer class=“footer”>

<div class=“container”>

<nav>

<ul class=“footer-menu”>

<li>

<a href=“#”>

Pavan ######

</a>

</li>

</ul>

</nav>

</div>

</footer>

</div>

</div>

<script>

function move() {

var elem = document.getElementById(“myBar”);

var width = 1;

if("+(s1[0]/10)+">35){ }

var id = setInterval(frame, 10);

function frame() {

if (width >= "+(s1[0]/10)+") {

clearInterval(id);

} else {

width++;

elem.style.width = width + '%';

}

move1();

}if("+(s1[0]/10)+<35&&"+(s2[0]/10)+">20){"

+ "document.getElementById(“theLabel1”).innerText = 'The pollution level is high.\\nSome of the sources of pollution in this Area can be:\\ni. Vehicular Pollution\\nii. Usage of Biogas\\niii. Burning Wood and Agricultural products\\nSuggestions:\\ni. Reduce Usage of Vehicles by pooling.\\nii. Check the pollution level of smoke emitter in vehicle\\niii. Using LPG gas stove than firewood'; }

+ "else if("+(s1[0]/10)+">35&&"+(s2[0]/10)+<20){"

+ "document.getElementById(“theLabel1”).innerText = 'The pollution level is Moderate.\\nSome of the sources of pollution in this Area can be:\\ni. Industrial Smoke.\\nii. Burning of Coal.\\niii. Natural Sources like Volcano\\nSuggestions:\\ni. Use Filter over Chimneys.\\nii. Using LPG gas.\\niii. Pollution check over the Industrial Smoke.'; }

+ "else if("+(s1[0]/10)+">35&"+(s2[0]/10)+">20){"

+ "document.getElementById(“theLabel1”).innerText = 'The pollution level is extremely high.\\nSome of the sources of pollution in this Area can be:\\ni. Vehicular Pollution\\nii. Usage of Biogas\\niii. Burning Wood and Agricultural products\\niv. Industrial Smoke.\\nv. Burning of Coal.\\nvi. Natural Sources like Volcano\\nSuggestions:\\ni. Reduce Usage of Vehicles by pooling.\\nii. Check the pollution level of smoke emitter in vehicle\\niii. Using LPG gas stove than firewood\\niv. Use Filter over Chimneys.\\nv. Using LPG gas.\\nvi. pollution check over the Industrial Smoke.'; }

+ "else{"

+ "document.getElementById(“theLabel1”).innerText = 'Good to go....clean air....';}

}

</script>

<script>

function move1() {

var elem = document.getElementById(“myBar1”);

var width = 1;

+ "if("+(s2[0]/10)+">20)elem.className = “bar bar-warning”;

var id = setInterval(frame, 10);

function frame() {

if (width >= "+(s2[0]/10)+") {

clearInterval(id);

} else {

width++;

elem.style.width = width + '%';

}

}

+ } </script>+

<script src=“./assets/js/core/jquery.3.2.1.min.js\type=“text/javascript”></script>

<script src=“./assets/js/core/popper.min.js\type=“text/javascript”></script>

<script src=“./assets/js/core/bootstrap.min.js\type=“text/javascript”></script>

http://www.jque.re/plugins/version3/bootstrap.switch/ -->

<script src=“./assets/js/plugins/bootstrap-switch.js”></script>

<script type=“text/javascript\src=“https://maps.googleapis.com/maps/api/js?key=YOUR\_KEY\_HERE”></script>

<script src=“./assets/js/plugins/chartist.min.js”></script>

<script src=“./assets/js/plugins/bootstrap-notify.js”></script>

<!-- Control Center for Light Bootstrap Dashboard: scripts for the example pages etc -->

<script src=“./assets/js/light-bootstrap-dashboard.js?v=2.0.1\type=“text/javascript”></script>

<!-- Light Bootstrap Dashboard DEMO methods, don't include it in your project! -->

<script src=“./assets/js/demo.js”></script>

</html>