Pi- Temperature Terminal web app using a Lighttpd, PHP5, and SQLite3 on the Raspberry Pi.

Complete Project Documentation
Embedded Linux

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Initialization Steps:

Step 1: Installation of Raspbian OS for Raspberry pi.

Step 2: Installation of lighttpd web server

Command: apt-get install lighttpd

Step 2: Installation of php5

Command: apt-get install php5, php5-common, php5-dev, php5-cli

Step 3: Install php5-cgi

Command: apt-get install php5-cgi

Step 4: Install sqlite3

Command: apt-get install sqlite3

apt-get install php5-sqlite

Step 6: Enable the fastcgi module and the php PDO drivers

Command: lighttpd-enable-mod fastcgi

lighttpd-enable-mod fastcgi {php

Step 7: Reload lighttpd

Command: service lighttpd force-reload

Step 10: Add the following contents to the file index.php into /var/www:

<?php phpinfo(); ?>

Setting up SQlite3 Database:

For the final version of project, database myLogger.db was created into /var/www location. Than table named myTemp was created into myLogger database using SQlite commands.

Command: sqlite> CREATEW TABLE myTemp(Time INTEGER, Temperature INTEGER);

tempData.csv file with data was given. It was than imported to table myTemp using following command.

Command: sqlite> .import temData.csv myTemp

It was than verified using following command,

Command: sqlite> SELECT * FROM myTemp;

Print a data table in a Table format on web page using HTML and PHP PDO.

Check_database.php file was created to print the data table on to html web browser. Check_database.php filw was also created into /var/www directory since /www refers to the web browser. Following code is in the check_database.php file.

```
<html>
<body>
<?php
try
{
$db = new PDO('sqlite:/var/www/myLogger.db');
```

```
$db->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

$result = $db->query('SELECT * FROM myTemp');
print "<table>";
print "<table border=1>";
print "<tr><th>Time</th><th>Temperature</th></tr>";
foreach($result as $row)
{
print "<tr>";
print "<td>".$row['Time']."</td>";
print "<td>".$row['Temperature']."</td>";
print "</tr>";
}
print "</table>";
$db = NULL;
}
catch(PDOException $e)
{
print 'Exception:'.$e->getMessage();
}
?>
</body>
</html>
```

Web App

HTML web interface file highchartAPI.php was created under /var/www. Following is the code for this file.

```
<!DOCTYPE HTML>
<html>
        <head>
                <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
                <meta http-equiv="refresh" content="10">
                <title>pi-Weather Terminal</title>

                <script type="text/javascript"
src="http://ajax.googleapis.com/ajax/libs/jquery/1.8.2/jquery.min.js"></script>
                <script type="text/javascript">
<?php
        try{
                $dbh = new PDO('sqlite:/var/www/myLogger.db');
                foreach($dbh->query('SELECT * FROM myTemp') as $row)
```

```
                {
                        $result_Temperature[] = $row['Temperature'];
                        $result_Time[] = $row['Time'];
                }
           }
        catch(PDOException $e) {
                echo $e->getMessage();
           }
?>

$(function () {
        $('#container').highcharts({
            title: {
                text: 'Temperatures',
                x: -20 //center
            },
            subtitle: {
                text: 'From given temperature data',
                x: -20
            },
            xAxis: {
                categories: [<?php echo join($result_Time, ',') ?>],
                title: {
                    enabled: true,
                    text: 'Time in Hours',
                }
            },
            yAxis: {
                title: {
                    text: 'Temperature (°C)'
                },
                plotLines: [{
                    value: 0,
                    width: 1,
                    color: '#808080'
                }]
            },
            tooltip: {
                valueSuffix: '°C'
            },
            legend: {
                layout: 'vertical',
                align: 'right',
                verticalAlign: 'middle',
                borderWidth: 0
            },
```

```
            chart: {
                type: 'area',
                marginLeft: 50
            },
            plotOptions: {
                series: {
                        color: '#FECD67',
                        marker: {
                     fillColor: 'red',
                     lineWidth: 2,
                     lineColor: 'grey'
                    }
                }
            },
            series: [{
                name: 'Temperature by Time',
                data: [<?php echo join($result_Temperature, ',') ?>],
                color: '#FFBD00'
            }]
        });
    });

                </script>
        </head>
        <body>
<h1><font = "papyrus" color = "ivory"><i>pi</i>-Temperature Terminal</font><br></h1>
<style type = "text/css">
        h1{text-align: center;font-size: 600%;background-color: grey;}
        .names{font-size: xx-large}</style>
<body background="tempImage.jpg">
div id="container" style="min-width: 200px; width: 1100px; height: 500px; margin: 0; float:right;
auto">
<script src="../../js/highcharts.js"></script>
<script src="../../js/modules/exporting.js"></script>
</div>
<div style="float:left;">
<?php

        try{
                $dbh = new PDO('sqlite:/var/www/myLogger.db');
                print "<table>";
                print "<table border=1 bgcolor=grey bordercolor=brown style=color:ivory>";
                print "<tr><th>Time</th><th>Temperature</th></tr>";
                foreach($dbh->query('SELECT * FROM myTemp') as $row)
                {
```

```
                        print("<tr>");
                        print("<td align=center>". $row['Time'] ."</td>");
                        print("<td align=center>". $row['Temperature'] ."</td>");
                        print("</tr>");
                }
        print"</table>";
        $dbh = NULL;
        }
        catch(PDOException $e) {
                echo $e->getMessage();
           }


?>
</div>
        </body>
</html>
```

Reference website links used in this project

1. http://raspberrywebserver.com/cgiscripting/rpi-temperature-logger/
2. http://raspberrywebserver.com/sql-databases/accessing-an-sqlite-database-with-python.html
3. http://webwash.net/tutorials/intro-visualization-api-part-2-highcharts-and-code
4. https://google-developers.appspot.com/chart/interactive/docs/gallery/areachart
5. http://www.python-sqlite-database.com/Python_SQLite_Databases.pdf
6. http://sharedmemorydump.net/post/2013-07-18-logging-data-temperature-with-raspberry-pi