ECEA 5347- Project 2

Implementation/Assumption Notes

Objective- Create an HTML/CSS user interface that will:

1. Display temperature & humidity read in from a pseudo sensor, respond to events (e.g. button presses) and send data to code (e.g. text fields)
2. Start your HTML UI (load it into a browser) and connect to the Tornado Webserver.
3. Indicate errors if the webserver is not available or the connection can not be established.
4. Provide a Qt button that will read 10 values from the pseudo sensor with a one second delay between each reading (these values will be stored with their timestamps) – you can decide how this is displayed on the UI – showing data items read, showing completion, etc.
5. Provide a Qt button that will cause the main Python program to calculate and display on the UI from the last 10 (or less) temperature/humidity pairs read in – include minimum, maximum, and values for each reading type
6. Include two fields to set temperature and humidity alarm values; if the main Python program sees any temperature or humidity read from the pseudo sensor exceeds the alarm value, indicate an alarm on the UI – these alarm fields should have default values at startup
7. Displays a Qt button on the UI that will close the UI and end the Python main program
8. A button to close the window and end the program.
9. Data from the pseudo sensor is humidity between 0 and 100%, and temperature between -20 and 100 degrees Fahrenheit.

Additional Notes

1. IDE is set up with: VSCode, Win10, HTML5, Python, Tornado Webserver.

Tornado.py

```python
import tornado.ioloop
import tornado.web
from datetime import datetime
from time import sleep
import random
from statistics import mean


class IndexHandler(tornado.web.RequestHandler):
    def get(self):
        self.render("index.html")

class WeatherOne(tornado.web.tornado.web.RequestHandler):
    def get(self):
        tempin = str(random.randint(-20, 100))
        humin = str(random.randint(0, 100))
        now = datetime.now()
        timein = str(now.strftime("%H:%M:%S"))
        self.render("getOne.html", tempin=tempin, humin=humin, timein=timein)

class WeatherTen(tornado.web.tornado.web.RequestHandler):
    def get(self):
        t=[]
        h=[]
        n=[]
        for i in range(10):
            tempin = str(random.randint(-20, 100))
            t.append(int(tempin))
            humin = str(random.randint(0, 100))
            h.append(int(humin))
            now = datetime.now()
            timein = str(now.strftime("%H:%M:%S"))
            n.append(timein)
            sleep(1)
        tsum=sum(t)
        tlen=len(t)
        avgt=tsum/tlen
        hsum=sum(h)
        hlen=len(h)
        avgh=hsum/hlen
        maxt=max(t)
        mint=min(t)
        maxh=max(h)
        minh=min(h)
```

```python
        self.render("getTen.html", t=t, maxt=maxt, mint=mint, avgt=avgt, h=h, maxh=maxh, minh=minh, avgh=avgh, n=n)

app = tornado.web.Application([
    (r"/",IndexHandler),
    (r"/getoneweatherplease", WeatherOne),
    (r"/gettenweathers", WeatherTen)
])

app.listen(8080)
tornado.ioloop.IOLoop.current().start()
```

index.html

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Weather App!</title>
    <style>
    body {background-color: #4ABDAC;}

    h1 {
        color: white;
        font-family: verdana;
        font-size: 300%;}

    .button {
        background-color: #FC4A1A; /* Burnt orange */
        border: none;
        color: white;
        padding: 15px 32px;
        text-align: center;
        border-radius: 3px;
        text-decoration: none;
        display: inline-block;
        font-size: 16px;
}
    </style>
</head>
<body>
    <h1>Welcome to the ECEA 5347</h1>
    <h1>WEATHER APP!</h1>
```

```html
    <p><a href="http://localhost:8080/getoneweatherplease"><button class="button"
 name="Get one button" type="button">Get Current Weather</button></a></p>
    <p><a href="http://localhost:8080/gettenweathers"><button class="button" name
="Get ten button" type="button">Get 10-point weather history</button></a></p>
    <p><a href="http://www.google.com"><button class="button" name="Goog" type="b
utton">Quit and go to Google</button></a></p>

    <p><label for="temp alarm">Alert me if temperature greater than:</label></p>

    <select name="humidalrm" id="humid">
        <option value="-10">-10</option>
        <option value="0">0</option>
        <option value="10">10</option>
        <option value="20">20</option>
        <option value="30">30</option>
        <option value="40">40</option>
        <option value="50">50</option>
        <option value="60">60</option>
        <option value="70">70</option>
        <option value="80">80</option>
        <option value="90">90</option>
    </select>
<p><label for="humid alarm">Alert me if humidity greater than:</label></p>

<select name="humidalrm" id="humid">
  <option value="0">0</option>
  <option value="10">10</option>
  <option value="20">20</option>
  <option value="30">30</option>
  <option value="40">40</option>
  <option value="50">50</option>
  <option value="60">60</option>
  <option value="70">70</option>
  <option value="80">80</option>
  <option value="90">90</option>

</select>
</body>
</html>
```

getOne.html

```html
<html>
    <head>
```

```html
    <title>Current Weather</title>
    <style>
      body {background-color: #4ABDAC;}

      h1 {
          color: red;
          font-family: verdana;
          font-size: 300%;}

      .button {
          background-color: #FC4A1A; /* Burnt orange */
          border: none;
          color: white;
          padding: 15px 32px;
          text-align: center;
          border-radius: 3px;
          text-decoration: none;
          display: inline-block;
          font-size: 16px;
    }
      p {
          color: white;
          font-family: verdana;
          font-size: 120%;}
    </style>
  </head>
  <body>
   <ul>
      <p>The current temperature is: {{ escape(tempin) }} degrees fahrenheit</p>

      <p>The current humidity is: {{ escape(humin) }}%</p>
      <p>The current time is: {{ escape(timein) }}</p>
       {%if int(tempin)>50 %}
          <h1>The current temperature is over 50 degrees! </h1> {%end%}

    </ul>
  </body>
 </html>
```
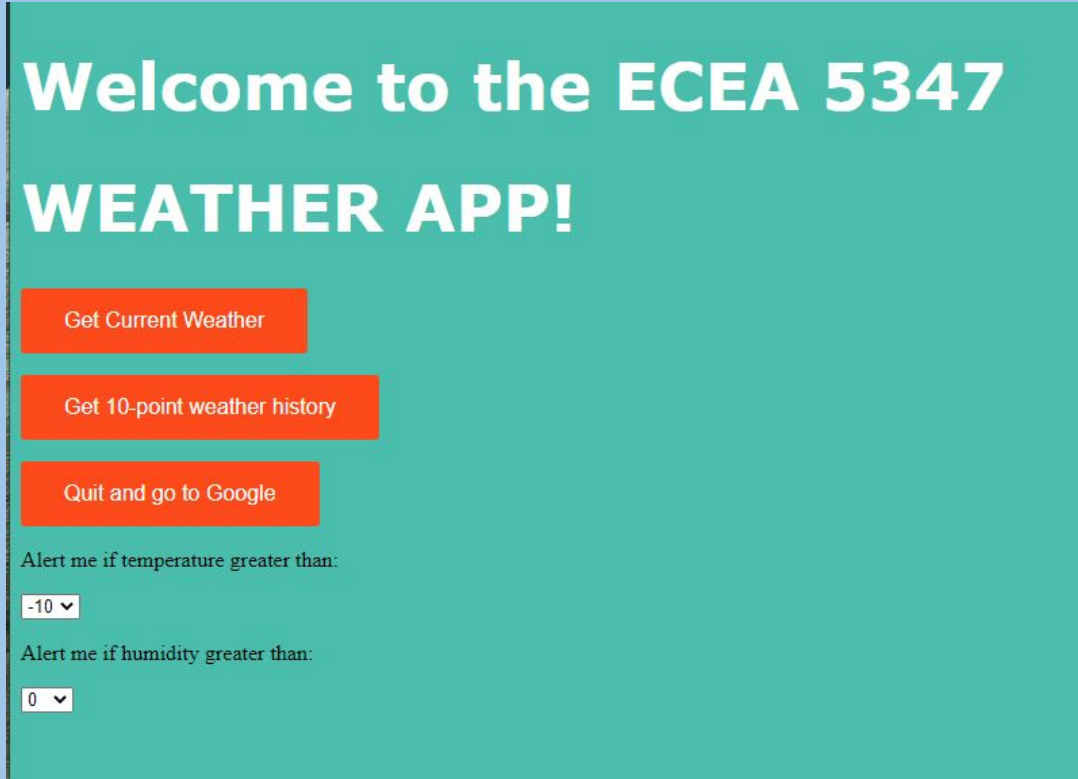
getTen.html

```html
<html>
   <head>
     <title>Current Weather</title>
     <style>
```

```
        body {background-color: #4ABDAC;}

        h1 {
            color: red;
            font-family: verdana;
            font-size: 300%;}

        .button {
            background-color: #FC4A1A; /* Burnt orange */
            border: none;
            color: white;
            padding: 15px 32px;
            text-align: center;
            border-radius: 3px;
            text-decoration: none;
            display: inline-block;
            font-size: 16px;
    }
        p {
            color: white;
            font-family: verdana;
            font-size: 120%;}
        </style>
    </head>
    <body>
      <ul>
        <p>The current temperature is: {{ escape(tempin) }} degrees fahrenheit</p
>
        <p>The current humidity is: {{ escape(humin) }}%</p>
        <p>The current time is: {{ escape(timein) }}</p>
         {%if int(tempin)>50 %}
            <h1>The current temperature is over 50 degrees! </h1> {%end%}

      </ul>
    </body>
 </html>
```

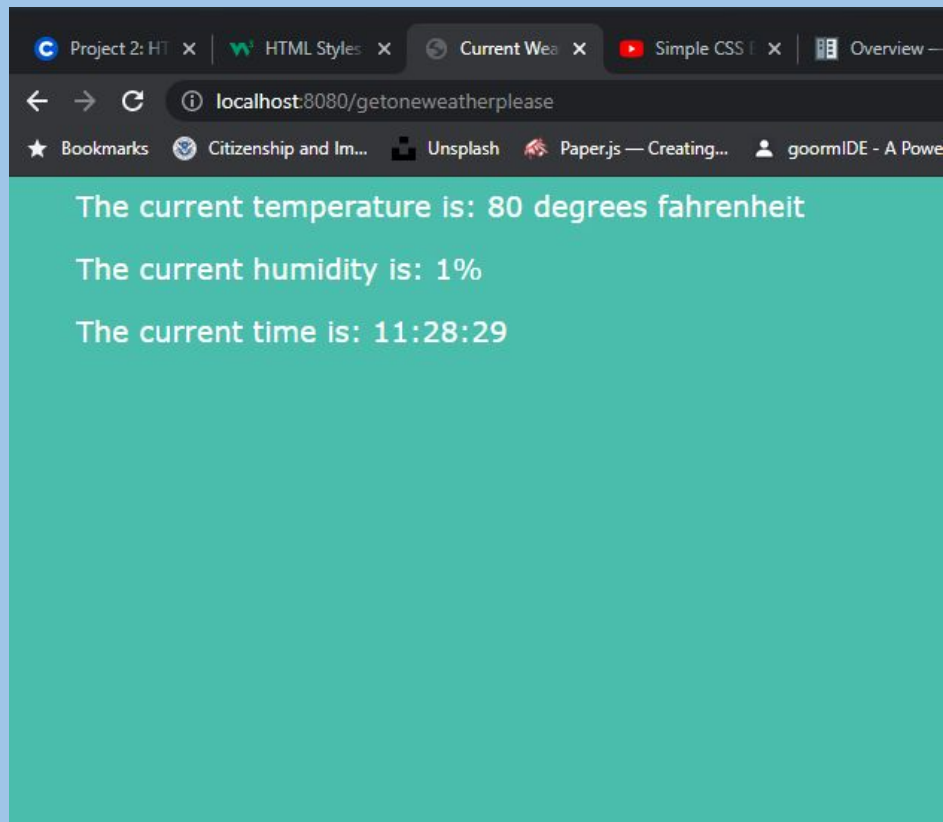UI at startup

Error condition

This site can't be reached

localhost refused to connect.

Try:
- Checking the connection
- Checking the proxy and the firewall

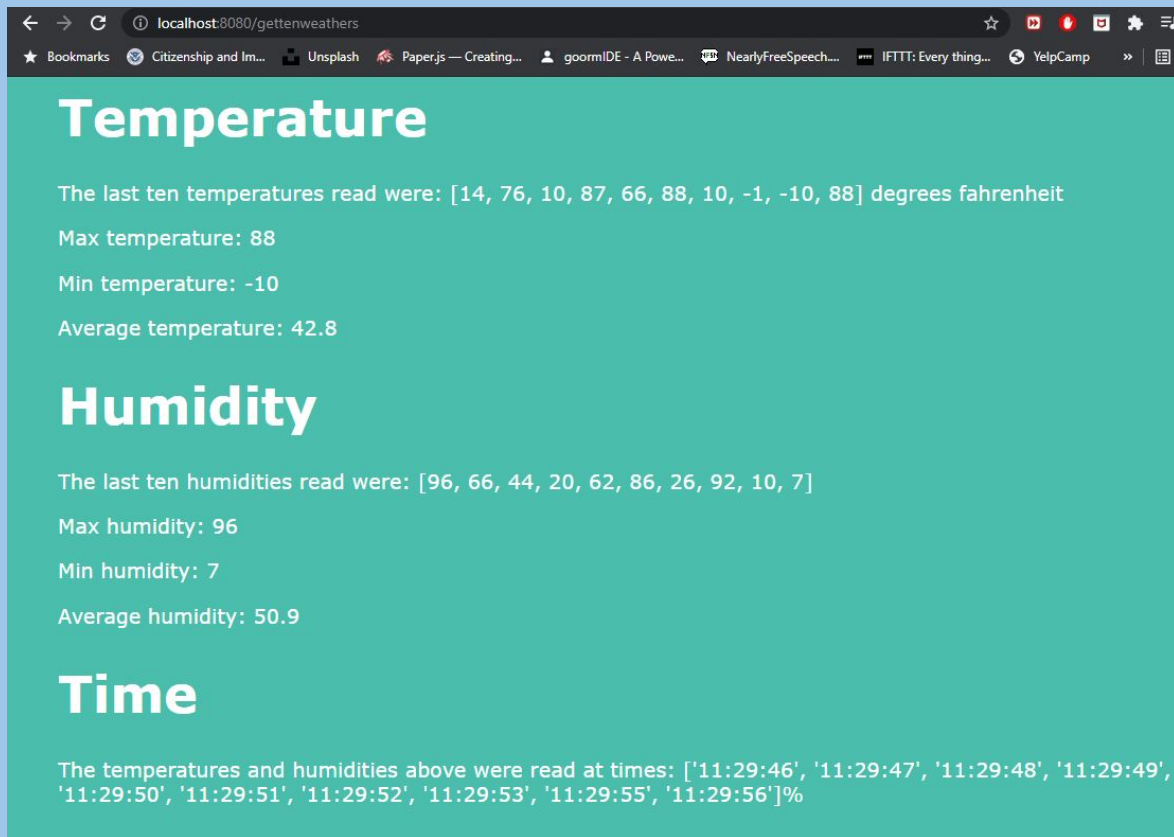ERR_CONNECTION_REFUSED

Single reading

Temperature

The last ten temperatures read were: [14, 76, 10, 87, 66, 88, 10, -1, -10, 88] degrees fahrenheit

Max temperature: 88

Min temperature: -10

Average temperature: 42.8

Humidity

The last ten humidities read were: [96, 66, 44, 20, 62, 86, 26, 92, 10, 7]

Max humidity: 96

Min humidity: 7

Average humidity: 50.9

Time

The temperatures and humidities above were read at times: ['11:29:46', '11:29:47', '11:29:48', '11:29:49', '11:29:50', '11:29:51', '11:29:52', '11:29:53', '11:29:55', '11:29:56']%

Temperature alert

The current temperature is: 89 degrees fahrenheit

The current humidity is: 82%

The current time is: 11:36:03

The current temperature is over 50 degrees!