CSCD 330 - Computer Networks

Lab 2, Web API

Overview:

Write a Python program to plot the hourly temperature forecast at the address of a company that owns a specified domain name. Your program will have to make several different API calls to accomplish this task.

Instructions:

Complete the provided program (`lab2.py`) following the steps in the next section. You **must** use the APIs listed in those steps.

In lab2.py put your own name where it says author, e.g., `# author: YOU NAME`. Your output should be similar to the provided example output. You must also create a README explaining how to run your program AND answering the questions below. Furthermore, you must create a test script in Bash that contains at least 3 tests.

If you are unfamiliar with Bash, use this link to access a cheat sheet. Your bash file should be named `test.sh`.

You may **only** use the following imports:

```
from json import loads
from requests import get
from socket import gethostbyname
from subprocess import getstatusoutput
from sys import argv
import matplotlib.pyplot
import numpy
```

Steps:

1. URL to IP

The first step is to look up the IP address of the specified domain name. You might recall we did DNS resolution in lab 1.

2. IP to Physical Address

Next, you'll need to get the physical address of the company who registered the IP address from step 1. `whois`, also from lab 1, should be able to accomplish this.

3. Physical Address to lat/lon

Now that you have the physical address, you need to use a web API to find the latitude and longitude for that location. Use the API provided by:
https://geocoding.geo.census.gov/geocoder/Geocoding_Services_API.html

4. lat/lon to Weather

With the latitude and longitude we can use a web API to pull the weather. Use the API provided by:
https://weather-gov.github.io/api/general-faqs. You'll need to use the API to access the **hourly** weather data. Hint: the provided code looks at the forecast data **not** the hourly data.

5. Plotting temperatures

We have provided a function that will plot the temperature data for you (`plot_temps`). To use it, you must supply a list of hourly temperatures to the function call. Include in your turn in at least one plot(as a picture).

Questions:

1. What is an API?
2. What is a RESTful API? Were the APIs we used RESTful?
3. What is JSON? Did these APIs use JSON?
4. What is Bash? Have you ever used Bash?

Turn in:

Submit a tarball with the following:

- Your source code (in Python) called `lab2.py`.
- Your test script (in Bash) called test.sh – this must test at least 3 sites.
- A picture (1) of the graph created in step 5.
- Your README answering the above questions AND explaining how to run your program.

In case you have forgotten: `tar -czvf lab2_YOURNAME.tar.gz *.py *.sh README *.png`

Example output: