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CSS 436 – Autumn

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Program 2: REST Report

Purpose

The programmable Web or cloud communicates via web services which expose RESTful APIs. This assignment explored the creation of a client app which consumes a RESTful API. Generally, when using the Cloud, there are SDKs that are used to abstract away the message passing details such as HTTP and GET. However, this app does not use the Cloud and simply uses HTTP to GET from the web. Lastly, this assignment requires working with the de-serialization of JSON or XML response content.

General Explanation of Program

This program takes as input the name of a city and provides information about the weather for that city. To accomplish this, I used the RESTful API of OpenWeatherMap. OpenWeatherMap provides an API to fetch weather data from their services. Specifically, this program uses the Current Weather Data API, with access to current weather data for over 200,000 cities. Current weather is frequently updated based on global models and data from more than 40,000 weather stations. The data is available in JSON, XML, or HTML format, and is free to all registered accounts.

The data of OpenWeatherMap can be retrieved using an API key and the query parameter of a city name. Therefore, the application can receive weather information for user display by requesting data with an HTTP GET to the API's URI appended with the key and query parameters. If the GET was successful, then the responses content is parsed and prepared for display. However, if the GET was not successful, then an error message is displayed along with the status code of the HTTP response.

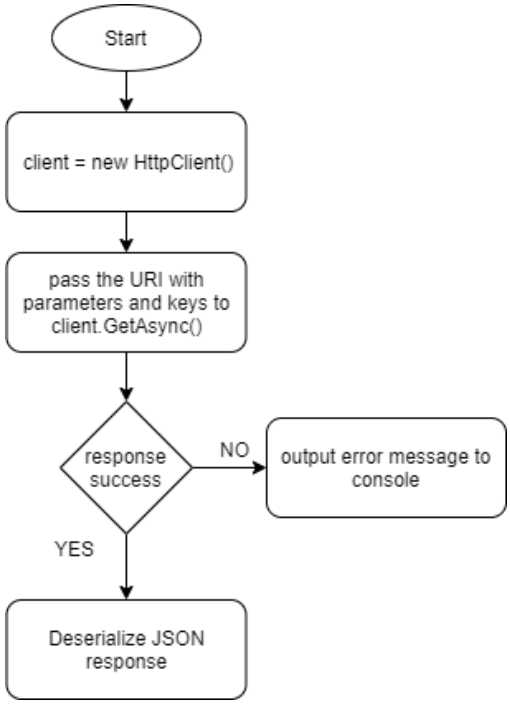
Parsing the HTTP response requires the de-serialization of the JSON in the responses content. Using Newtonsoft.Json, the JSON can be converted into an object with appropriately populated parameters. After successfully converting the JSON to an object (RootObject), the weather information can simply be accessed and displayed to the user in a readable format.

Design / Implementation

- **HTTP Get**
    - The base URI used to access the OpenWeatherMap API:
        - http://api.openweathermap.org/data/2.5/
    - To make an HTTP GET request to the OpenWeatherMap API, an API key and query parameters must be appended to the base URI.
        - …weather?q=cityname&APPID=key
    - Figure 1 shows the activity flow of the HTTP GET request.

- **JSON Deserialization**
    - The RootObject class must exist in the project directory in order to convert the JSON string to a RootObject. The RootObject class can be created by copying the JSON string and (in Visual Studios 2017) navigating to:
        - Edit > Paste Special > Paste JSON as Classes
    - The JSON can then be converted to a RootObject using Newtonsoft.Json:
        - JsonConvert.DeserializeObject<RootObject>(result);
    - The resulting RootObject can then access all the populated parameters and be used for displaying the results to the user.

Figure 1: Activity Flow Diagram of HTTP Client Get



Usage

To build this application, run the CSC script with input parameters of Program.cs and RootObject.cs. The program will then be built with the necessary HTTP and JSON dll's.

To use this application, run the .exe at the command line an argument of the city's name. The city can contain multiple words with spaces between them. For example:

- .exe Seattle
- .exe New York
- .exe Rio De Janeiro

All times are outputted as local times. Therefore, sunrise and sunset show the time that the sun would rise or set for that city in your own local time.