CS421/621 Lab04

Python & API

Objectives:

- Python programming and retrieving data using API (lecture 5)

In this lab tutorial on APIs in Python, you will learn how to retrieve data from remote websites. Most of the popular websites make some part of the their data available for others through their **A**pplication **P**rogramming **I**nterface.

You have learned the importance and the practical aspects of the API usage in lecture 5. Today, we will be using APIs to retrieve data related to Covid-19. I recommend you to use Anaconda& Jupyter notebook for this lab. If you haven't tried iPython before, I suggest you to do so. (You can use any IDE or editor for this lab, anaconda and Jupyter iPython is just a suggestion)
Here are the links for installation;

Anaconda https://www.anaconda.com/products/individual

Jupyter Notebook. https://jupyter.readthedocs.io/en/latest/install.html#installing-jupyter-using-anaconda-and-conda

A useful tutorial about jupyter
https://www.youtube.com/watch?v=HW29067qVWk&feature=youtu.be

What is CURL?

It is a tool to transfer data from or to a server without user interaction. CURL stands for "Client URL" and it provides a library and command-line tool. It is a widely used tool because of its ability to be flexible and complete complex tasks.

Syntax:
curl [options] [URL...]

Covid19 API

Let's get started with the Covid19 API. We can list all the current routes available with detail on each

```
!curl --location --request GET 'https://api.covid19api.com/'
```

We can get a summary of new and total cases per country updated daily

```
!curl --location --request GET 'https://api.covid19api.com/summary'
```

We can list the available countries and provinces. (country slugs are also included)

```
!curl --location --request GET 'https://api.covid19api.com/countries'
```

Finally, let's get all live cases by case type for a country

```
!curl --location --request GET 'https://api.covid19api.com/live/country/united-states/status/confirmed'
```

Exercise 1

Use the last example to get the live case numbers for United States of America. Display the information of the state's which has the most confirmed cases and least confirmed cases. Additionally, display the average number of active cases. You can use any method you feel comfortable to manipulate the data (NumPy or Pandas are recommended)

Now, we will use another API and library to manipulate the Covid19 data.

We will start by installing COVID19Py ;

```
!pip install COVID19Py

Collecting COVID19Py
  Downloading COVID19Py-0.3.0.tar.gz (4.9 kB)
Building wheels for collected packages: COVID19Py
  Building wheel for COVID19Py (setup.py) ... done
  Created wheel for COVID19Py: filename=COVID19Py-0.3.0-py3-none-any.
c478dcb4f1fd984fed2691d6eda74c5714b7d
  Stored in directory: /Users/mahmutunan/Library/Caches/pip/wheels/e9
aa7c893a5
Successfully built COVID19Py
Installing collected packages: COVID19Py
Successfully installed COVID19Py-0.3.0
```

In order to retrieve the data, we will first import the package and then create a new instance;

```python
import COVID19Py
covid19 = COVID19Py.COVID19()
```

There are 3 different data sources available in this API, we will be using John Hopkins University Center for Systems Science and Engineering (JHU CSSE). Thus, we can retrieve the data only from this data source;

```python
covid19 = COVID19Py.COVID19(data_source="jhu")
```

We can get the latest update for all countries;

```python
latest = covid19.getLatest()
```

```python
print(latest)
```

Finally, let's try to retrieve the information by location

```python
location = covid19.getLocationByCountryCode("US")
```

```python
print (location)
```

Exercise 2

Display a table which shows the total number of cases for each state in US. A sample table is provided below;

State	Total Number of Cases
Alabama	
Alaska	
…..	

If you return these two exercise before the deadline, a bonus points will be provided. You can submit your solution directly to the Canvas. The deadline is 07/06/2020 Monday 11:59pm

References & Recommended Links

https://rapidapi.com/blog/how-to-use-an-api-with-python/

https://documenter.getpostman.com/view/10808728/SzS8rjbc?version=latest

https://towardsdatascience.com/covid-19-data-collection-a-python-api-story-347aafa95e69

https://github.com/ExpDev07/coronavirus-tracker-api/blob/master/README.md#picking-data-source

https://github.com/Kamaropoulos/COVID19Py

https://curl.haxx.se/

https://man7.org/linux/man-pages/man1/curl.1.html