

Programming fundamentals for Python

HTTP

Pepe García jgarciah@faculty.ie.edu

2020-04-20

Plan for today

- Internet basics

Plan for today

- Internet basics
- HTTP

Plan for today

- Internet basics
- HTTP
- Requests library

Plan for today

- Internet basics
- HTTP
- Requests library
- Exercises

The Internet

The internet is a **VERY BIG** computer network. It forms a **graph** of computers ones connected to others.

Discuss the Internet in the whiteboard.

HTTP is the protocol that powers The Internet:

Based on **requests** and **responses**.

Clients do requests and **servers** answer with responses

HTTP requests

GET / HTTP/1.1

Accept: text/html

Host: www.example.com

HTTP Responses

Status

HTTP/1.1 200 OK

Date: Mon, 23 May 2005 22:38:34 GMT

Content-Type: text/html; charset=UTF-8

Content-Length: 138

Last-Modified: Wed, 08 Jan 2003 23:11:55 GMT

Server: Apache/1.3.3.7 (Unix) (Red-Hat/Linux)

ETag: "3f80f-1b6-3e1cb03b"

Accept-Ranges: bytes

Connection: close

{"user": "pepegar", "age": 55}

HTTP Requests

HTTP requests and responses are messages interchanged between client and server

HTTP requests may contain a lot of metadata but for us, today, the only field that matters is the URL:

HTTP Clients

HTTP clients send requests to HTTP servers. The most iconic case for HTTP clients is web browsers.

Web browsers are HTTP clients that allow us to navigate the web with our computer.

HTTP Clients

Deconstruct what happens when we browse the web (Developer mode)

start at

<https://en.wikipedia.org/wiki/Echidna>

Web APIs

Web APIs, or just APIs are the most common way for exposing information from a web server.

Most web APIs communicate using a data interchange format such as **JSON** or **XML**.

JSON

`http://json.org`

JSON is a data interchange format used to share data between HTTP clients and servers. Some valid JSON values are:

`[1,2,3]` # lists

`1` # numbers

`"potatoes"` # Strings

`{"name":"Pepe","surname":"Garcia"}` # dictionaries

Using JSON

```
json_encoded_string = """  
    {"name": "Pepe", "last_name": "García"}  
    """
```

Let's **parse** this JSON string from Python using the **json** module

requests library

Requests is the most famous HTTP library for Python. It has an HTTP client as well as other useful utilities such as JSON handler, etc.

It should be already installed in your computers thanks to Anaconda.

We can use requests to get an HTTP response as follows:

```
import requests

response = requests.get("url")

data = response.text
```

Practice

Let's try using **requests** to get the homepage of <http://google.com>

requests + json

Requests has builtin function for handling JSON responses

```
response = requests.get('http://api.open-notify.org/astros.json')  
  
response.json()
```

Use **`http://api.open-notify.org/astros.json`**

Call the API and print a message like:

```
There's currently 78 people in space:
```

- Christina Coch
- Alexander Skvortsov
- ...

Use the Star Wars API to list all planet names from star wars.

`https://swapi.co/`

Fuel for crazy ideas

<https://github.com/toddmotto/public-apis>

Exercises

Exercise 1

Create a function that uses the **requests** library to get the lyrics of a song.

You can use the **lyrics.ovh** api as described here:

<https://lyricsovh.docs.apiary.io/#reference/0/lyrics-of-a-song/search?console=1>

Exercise 1

Create a function that returns the current latitude and longitude of the ISS

<http://api.open-notify.org/>