Programming fundamentals for Python. HTTP 1

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Plan for today

- Internet basics
- HTTP
- Requests library
- Exercises
- Extra time for homework / individual assignment

The Internet

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

Internet

Discuss the Internet in the whiteboard

HTTP

HTTP is the protocol that moves 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
```

Verb

Headers

URL

more...

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}
```

Headers

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.

Web APIs

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

Nowadays most of them use **JSON.**

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.

requests library

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()
```

requests library

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
-...
```

requests library

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

Break

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/

Exercise 3

API is not there anymore :(

~~using the given population API, create a program that:~~

~~- gets a list of all available countries~~

~~- Gets the first 10 countries~~

~~- Gets the country's today & tomorrow population.~~

~~http://api.population.io/#!/countries/listCountries~~