Advanced Programming with Python

REST APIs

Pepe García jgarciah@faculty.ie.edu

SCHOOL OF SCIENCE & TECHNOLOGY

Plan for today

- REST
- REST in the server with Flask
- consuming REST APIs wiht requests

SCHOOL OF SCIENCE & TECHNOLOGY

What's an API

From Wikipedia

An application programming interface is a way for two or more computer programs to communicate with each other. It is a type of software interface, offering a service to other pieces of software. A document or standard that describes how to build or use such a connection or interface is called an API specification. Wikipedia

SCHOOL OF SCIENCE & TECHNOLOGY

What's an API

Basically, a way of exposing a web server so that it can be used **from other software components**.

In order to be used from other software components, they must use a data interchange format. In our examples we'll use JSON.

SCHOOL OF SCIENCE & TECHNOLOGY

What's REST

We call REST APIs to APIs that follow some particular principles:

- They use **URIs for resources**
- They're **stateless**

What's REST. URIs for resources

Resources in your API must be represented as URIs.

Different operations on them are represented with different HTTP methods on that URI.

- `POST` for creating a resource
- `GET` for reading a resource
- `PUT` for updating a resource
- `DELETE` for deleting a resource

Example URIs

```
http://api.pepe.com/games/1
http://aws.amazon.com/ec2/instances/0f9304a4-e4f8-4d95-acce-bc
```

SCHOOL OF SCIENCE & TECHNOLOGY

What's REST. Statelessness

This means that the HTTP Request must come with everything needed in order to fulfill it.

Creating REST APIs in Flask

Example

Let's see an example of a REST API in `api.py`.

Creating REST APIs in Flask

Exercise

Create a new endpoint in our API that returns a JSON with all transactions for a given user.

SCHOOL OF SCIENCE & TECHNOLOGY

Creating REST APIs in Flask

Exercise

Create a endpoint in our API that allows updating a user's shop.

SCHOOL OF SCIENCE & TECHNOLOGY

Consuming REST APIs with requests

All HTTP methods that we talked about before are represented as function in the **requests** library.

```
import requests

requests.get("http://localhost:8080/users")
requests.post("http://localhost:8080/users", json={"a": 1})
requests.put("http://localhost:8080/users", json={"a": 1})
requests.delete("http://localhost:8080/users")
```

SCHOOL OF SCIENCE & TECHNOLOGY

Consuming REST APIs with requests

Create an endpoint to delete a users's transaction. Call the endpoint from client.py

Alternatives to Flask to build REST APIs

Nowadays it's very common to use FastAPI instead of Flask for REST APIs. It's inspired by Flask, and has lots of interesting functionality, check it out!