PyLadies

Vienna 17.10.2020

Who?

International mentorship group with a focus on helping more women become active participants and leaders in the Python open-source community.

Our mission is to promote, educate and advance a diverse Python community through outreach, education, conferences, events and social gatherings.

Agenda for today

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1. What is API, REST API

2. How to use already created API

3. How to create your own API

Goals

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- Understand what is the API and why they are so cool
- Learn how to use API
- Learn how to create API

What is an API

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- Application programming interface
- Way to interact between software components
- created by you x created by others for your usage
- Use API - you need to know what and how = definition of API
- Hiding the complexity from the user

What is an API

- Abstraction
- Communicating through protocol (sending XML over HTTP originally)
- E.g. - twitter API, way how to get tweets from twitter and have fun with them
- API exist basically for everything

REST API

- REpresentational State Transfer
- 6 principles to become REST
- Client-server, Stateless, Cacheable, Uniform interface, Layered system
- Flexible communication and display of information across the web while providing structure necessary to easily build general purpose components

Resource

- Can be anything - text, image, temporal service
- resource representation - state of the resource in certain time
- → consist of Data, Metadata and Hypermedia link, which helps client in transition to next state
- Media type - media type identifies a specification that defines how a representation is to be processed - you don't care what it actually is, because you know how it should behave

Resource Methods

- Type of request you can make on resource
- 5 basic types, usually allowed, many custom made
- GET - method retrieves a resource representation, do not change resource
- PUT - method to update resources or to create a new entity at a known URL using message body.

Resource Methods

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- DELETE - method removes a resource at a specific URL
- POST - method used for creating a resource in a collection when the final resource URL is not known. It is not safe and is not idempotent. Can lead to creating many new "items" even when the "item" has same information.
- PATCH - method used to make changes to part of the resource at a location. That is, it PATCHES the resource — changing its properties.

HTTP status codes

- Status code is server response to clients' request
- 5 main categories, distinguished by first digit
- 1xx informational response, 2xx successful, 3xx redirection, 4xx client error, 5xx server error
- Common examples – 200, 404, 403, 500, 502
- https://http.cat

Swagger

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- open source product
- Automated documentation for APIs - easy to see all endpoints and expected responses
- Help with development of API, visualisation and other benefits
- Supports 25 languages

Project 1 - use API

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- prepared simple "books" sqlite3 database on http://lubojr.pythonanywhere.com/
- We shall use **requests** library to try all 4 methods on this REST API (does not support PATCH at the moment)
- PUT is limited (does not work if book id does not exist)
- Structure: id integer primary key autoincrement, published integer, author VARCHAR, title VARCHAR, first_sentence VARCHAR

Project 2 - create (book) Flask API

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- We shall try to create REST API interface to the sqlite3 database and (deploy it on pythonanywhere)
- packages: flask, marshmallow, flask_sqlalchemy, marshmallow-sqlalchemy
- take existing database schema, declare sqlalchemy **model** of table
- create marshmallow schema of a table
- create flask endpoints using @app.route

Resources not only for this lecture

- Cheat sheet for Python:

  https://github.com/ehmatthes/pcc/releases/download/v1.0.0/beginners_python_cheat_sheet_pcc_all.pdf

- Hacktoberfest:

  https://hacktoberfest.digitalocean.com

  you still have time to participate :)

Sum it up

- API is useful way how to enable communication between your code and user or you and someone else's code
- Should always come with documentation how to use it and how to interpret response

Resources and materials general

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- advent of code - adventofcode.com
- hackerrank - hackerrank.com
- Django Girls django tutorial
- https://www.practicepython.org
- Nice Python exercices at one place
  https://github.com/tystar86/python_exercises
- https://automatetheboringstuff.com
- https://diveintopython3.problemsolving.io

Next topics

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Chatbot

Graphics

GUI

fill the form regarding your interests please :) →
https://forms.gle/UtfgVGe6AhhRwx539

Thank you and see you next time

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Coding session — **28.10.2020**

Next workshop — **14.11.2020** Chatbot!