REST API Development with Python and Flask

Modern REST APIs Made Easy

Jared M. Smith (@jaredthecoder)

May the 4th be with you!

Outline

— REST and REST API's

— Flask Overview

— Flask-Restful

— Demo

— Questions

What is REST?

- Stands for "Representational state transfer"
- Allows manipulation of textual representations of resources on the web

What is REST?

- Uses a standard and predefined set of **stateless** operations
- With HTTP, the operations are usually *GET*, *POST*, *PUT*, *DELETE*, etc.
- Resources live on *endpoints*, which are accessed at a specific URL path on the server, and endpoints return text, often in the form of JSON or XML

What is a REST API?

- An API that conforms to REST, of course!
- There are other API types, like SOAP or WSDL, but those are used very little in modern web stacks
- REST API's are everywhere, from Twitter to Facebook to Plaid to Mailchimp

What is Flask?

— Server-side web micro-framework for Python

— Extremely well documented

— Runs on Python 2.X and 3.X

— Dependencies:

  — Werkzeug: routing, debugger, WSGI

  — Jinja2: templating

Why Flask?

- Simple and understandable API
  - For example, you can use function decorators for routing
- Pick your poison
  - Choose the ORM (if any), caching frameworks, app layout, etc.
- It's scalable
  - Used by: Twilio, Uber, Pintrest, Mailgun, LinkedIn, and more

Designed to be Extensible

- Missing:
  - Database Access
  - Web form validation
  - User authentication and authorization
  - Email support
  - Caching
  - Administration
- Have no fear!

Adding On

— Database Access > SQLAlchemy

— Web Form Validation > WTFforms

— User Authentication and Authorization > Flask-Security

— Email Support > Flask-SMTP

— Caching > Flask-Cache

— Adminstration > Flask-Admin

— *and many more*...see https://github.com/humiaozuzu/awesome-flask

Making it Modular

- Flask lets you install only what you need without all the junk that other frameworks force on you

REST and Flask

- For these reasons, Flask is a great tool for building REST API's
- Other tools like Django and Django Rest Framework can be cumbersome
- We can test our APIs with tools like Postman or Paw (Mac Only)

Flask-RESTful

- Flask-RESTful is one of the more popular Flask REST API "frameworks"
  - Others include Eve and Flask-RESTplus
- This library just adds a few small tweaks onto Flask that makes programming REST API's very straightforward
- Flask-RESTful is also just another Flask extension, so it adds essentially no overhead to get started using it

Additional Extensions for Flask-Restful

- Rate Limiting: Flask-Limiter
- SQLAlchemy for database models
- Location-Based APIs: Geo-Alchemy
- Flask-Security for API tokens and permissions
- And many others like the ones in the earlier Flask add-ons slide
- Remember, Flask-RESTful is an extension itself, and works with pretty much every other Flask-RESTful

How does it work?

- Flask-Restful works by taking your view functions (remember Flask uses functions with decorators to send data around) and putting them in a class
- You have a class per *resource* (i.e. a resource for users and a resource for comments)
- Each resource class has methods for *GET*, *POST*, *PUT*, *DELETE*, etc.
- You work with the individual functions of each class just like you would a normal Flask view function on it's own

Installation

— Linux and Mac

```
~ > virtualenv my_flask_app
~ > source my_flask_app/bin/activate
(my_flask_app) ~ > pip install flask flask-restful flask-limiter
```

— Windows

```
C:\ > virtualenv my_flask_app
C:\ > my_flask_app/bin/activate
(my_flask_app) C:\ > pip install flask flask-restful flask-limiter
```

Demo Time!

Get the code here: https://github.com/jaredthecoder/knoxpy-05-04-17-flask-restful.

Conclusions

- REST API's enable much of the modern web
- Flask and Flask-RESTful are an amazing combination to compose simple to complex REST API's in Python
- Many extensions exist for security, rate-limiting, databases, and much more

Questions?

- Website: jaredthecoder.com
- Twitter: @jaredthecoder
- LinkedIn: linkedin.com/in/jaredthecoder
- Email: jared@jaredthecoder.com