Introduction to Web APIs

With Python and Flask

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What is an API?

Application Programming Interfaces

Endpoints that allow developers to create complex functionality more easily by abstraction

How the world is run by APIs

- Google Maps API
- Weather data
- Social Logins
- Communication
- and more…

Making a request to an API

Astronomy Picture of the Day


```
 {
  "copyright":"Jose Mtanous”,
  “date”:"2021-01-05",
  "explanation":"What is the Small Magellanic Cloud? It has turned out to be a galaxy.  People who have wondered about this little fuzzy patch in the southern sky included Portuguese navigator Ferdinand Magellan and his crew, who had plenty of time to study the unfamiliar night sky of the south during the first circumnavigation of planet Earth in the early 1500s. As a result, two celestial wonders easily visible for southern hemisphere skygazers are now known in Western culture as the Clouds of Magellan. Within the past 100 years, research has shown that these cosmic clouds are dwarf irregular galaxies, satellites of our larger spiral Milky Way Galaxy. The Small Magellanic Cloud actually spans 15,000 light-years or so and contains several hundred million stars. About 210,000 light-years away in the constellation of the Tucan (Tucana), it is more distant than other known Milky Way satellite galaxies, including the Sagittarius Dwarf galaxy and the Large Magellanic Cloud. This sharp image also includes the foreground globular star cluster 47 Tucanae on the right.”,
  “hdurl":"https://apod.nasa.gov/apod/image/2101/SMC_Mtanous_4464.jpg",
  “media_type":"image",
  “service_version":"v1",
  "title":"The Small Cloud of Magellan”,
  “url":"https://apod.nasa.gov/apod/image/2101/SMC_Mtanous_960.jpg"
  }
```

4 basic request methods

- GET
- POST
- PUT
- DELETE

Flask RESTful

Lets start building our own API!

```
from flask import Flask
from flask_restful import Resource, Api

app = Flask(__name__)
api = Api(app)

class HelloWorld(Resource):
    def get(self):
        return {'hello': 'world'}

api.add_resource(HelloWorld, '/')

if __name__ == '__main__':
    app.run(debug=True)
```

Activity 1

Let’s start coding!

Using APIs to pass arguments

Path Parameter

```
class Hello(Resource):
    def get(self, name):
        return {"Hello": name}

api.add_resource(Hello, '/hello/<string:name>')
```

- Within the path of the endpoint

localhost:5000/hello/tom name : tom

Using APIs to pass arguments

Query String Parameter

```
class HelloWorld(Resource):
    def get(self):
        name = request.args.get('name')
        return {"Hello": name}

api.add_resource(Hello, ‘/hello’)
```

localhost:5000/hello?name=tom name : tom

- At the back of the endpoint, after “?” separator

Using APIs to pass arguments

Request Body Parameters

```
response = requests.post('https://httpbin.org/post', data=payload)
```

```
{'phone':99212334,'age':18}
```

Make your own Weather app

Coding Time!

1. Using the Open Weather API, build your own weather app
2. Make use of flask_restful and requests

Objective:
Give city **name**, **temperature**, **description** of weather

Improve your Weather API with database

Persistence!

```
from flask_sqlalchemy import SQLAlchemy

app = Flask(__name__)
api = Api(app)
app.config['SQLALCHEMY_DATABASE_URI'] = 'sqlite:///weather.db'
db = SQLAlchemy(app)

class WeatherModel(db.Model):
    name = db.Column(db.String(30), primary_key=True)

db.create_all()
```

SQL Database

How it looks like

ID	Name
1	Singapore
2	Malaysia
3	Indonesia
4	Thailand