



Exploring APIs: My Newbie's Adventure

Master's degree in
Data science for Economics, Business and Finance

Laura PROTO

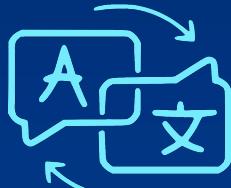
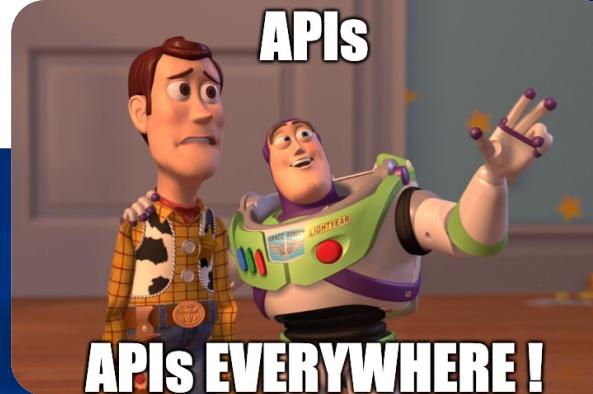
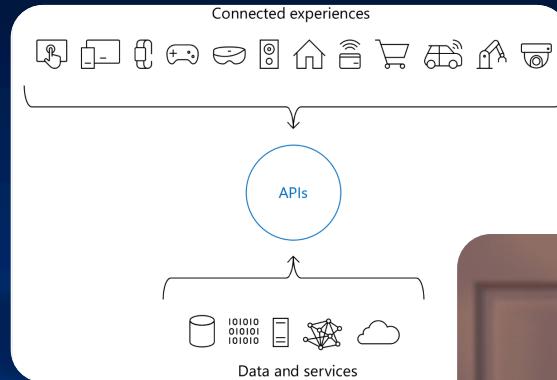
Academic year 2022/2023



What is an API ?

Application Programming Interface:

set of rules and protocols that allow different software to communicate with each other.



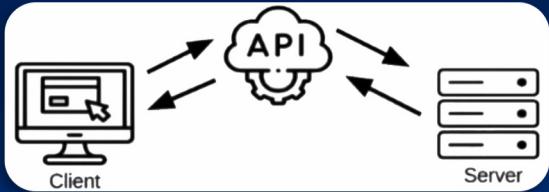
Project Structure

Theoretical concepts and practical applications

History



Design & operation



API in the company

Uber

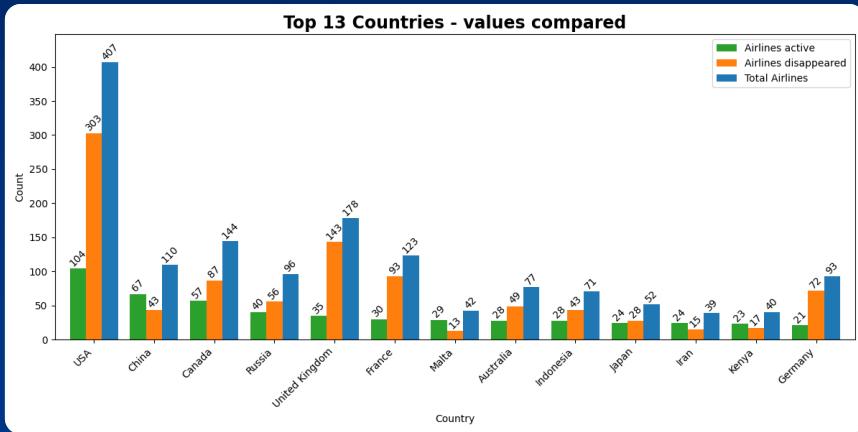
aws



Tools used



Let us to proceed in order: data and starting tools



[https://github.com/Laura1385/
projectaircraft_api](https://github.com/Laura1385/projectaircraft_api)



Scraping



```
jupyter main Last Checkpoint:
File Edit View Insert Cell Kernel Help Not Trusted

 6 while(len(alphabet) > 0):
 7
 8     print("https://www.airfleets.net/recherche/list-airline-{}.htm".format(alphabet[0]))
 9     num_pagein = ut.get_num_pages('https://www.airfleets.net/recherche/list-airline-{}.htm'.format(alphabet[0]))
10     print(num_pagein)
11     num_pagine = num_pagein.split('/')[-1]
12
13     for pagina in range(1,int(num_pagein)+1):
14         url = ''
15         if pagina == 1:
16             url = "https://www.airfleets.net/recherche/list-airline-{}_0.htm".format(alphabet[0])
17         else:
18             url = "https://www.airfleets.net/recherche/list-airline-{}_{}.htm".format(alphabet[0],(pagina-1))
19         data = requests.get(url,headers = {'User-Agent': 'Mozilla/5.0'} ,timeout=10,random=True)
20         soup = BeautifulSoup(data.content,'html.parser')
21         print('fetch indirizzo ()'.format(url,data))
22
23         for table in soup.find_all('table', class_="tablestd"):
24             for row in table.find_all('tr', class_="tabcontent"):
25                 for colonna in row.find_all('td'):
26                     row_names.append(colonna.text)
27                     #print('row names')
28                     #print('time row')
29
30                     rows.append(row_names)
31                     row_names = []
32             #time.sleep(1)
33         print('Delete letter {}'.format(alphabet[0]))
34         alphabet.pop(0)
35
36
37 print("\nAll letters have been taken!")
```

<https://www.airfleets.net/recherche/list-airline-i.htm>

 AIRCRAFT AIRLINE

117

www.ijerpi.org | 10

VERIFICATION

We need to verify that you are not a robot

ANSWER

View Details

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For more information about the study, please contact Dr. Michael J. Hwang at (310) 794-3000 or email at mhwang@ucla.edu.

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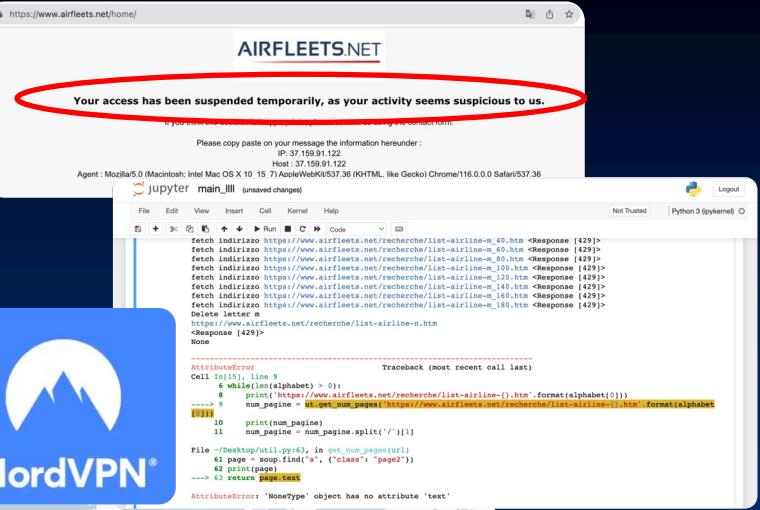
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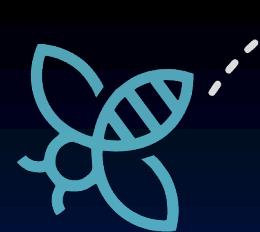
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The A.P.I.



default

- GET** /show_map Show Map
- GET** /airlines_db Get Airlines Db
- GET** /airline_info/{airline_name} Get Airline Info
- GET** /airlines_info_by_country/{country_name} Get Airlines Info By Country
- GET** /airlines_summary_by_country/{country_name} Get Airlines Summary By Country

← → C ⓘ http://127.0.0.1:8000/airlines_info_by_country.finland ⋆ ⚙ ⚙

```
{"Total":15,"Details":[{"Airline name":"Air Aland","Country":"Finland","info":"inactive (with supported aircraft)"}, {"Airline name":"Air Botnia","Country":"Finland","info":"inactive (with supported aircraft)Renamed / Merged to Blue 1"}, {"Airline name":"Air Finland","Country":"Finland","info":"inactive (with supported aircraft)"}, {"Airline name":"Alandia Air","Country":"Finland","info":"inactive (with supported aircraft)"}, {"Airline name":"Blue 1","Country":"Finland","info":"inactive (with supported aircraft)"}, {"Airline name":"Finnair","Country":"Finland","info":"55"}, {"Airline name":"Finnavia","Country":"Finland","info":"inactive (with supported aircraft)Renamed / Merged to Finnair"}, {"Airline name":"Finncomm Airlines","Country":"Finland","info":"inactive (with supported aircraft)Renamed / Merged to Flybe Nordic"}, {"Airline name":"Flybe Nordic","Country":"Finland","info":"inactive (with supported aircraft)Renamed / Merged to Nordic Regional Airlines"}, {"Airline name":"Flying Finn Airways","Country":"Finland","info":"inactive (with supported aircraft)"}, {"Airline name":"Jet Time Finland","Country":"Finland","info":"inactive (with supported aircraft)"}, {"Airline name":"Karo-air","Country":"Finland","info":"inactive (with supported aircraft)Renamed / Merged to Finnair"}, {"Airline name":"Nordic Global Airlines","Country":"Finland","info":"inactive (with supported aircraft)"}, {"Airline name":"Nordic Regional Airlines NORRA","Country":"Finland","info":"24"}, {"Airline name":"Soder Air","Country":"Finland","info":"inactive (with supported aircraft)"}]}
```

The documentation



Swagger Vs. ReDoc



FastAPI 0.1.0 OAS 3.1
openapi.json

default

GET /show_map Show Map

GET /airlines_db Get Airlines Db

Parameters

No parameters

Responses

Code Description

200 Successful Response

Media type application/json

Controls Accept header.

Example Value Schema

"string"

Links

GET /airline_info/{airline_name} Get Airline Info

GET /airlines_info_by_country/{country_name} Get Airlines Info By Country

GET /airlines_summary_by_country/{country_name} Get Airlines Summary By Country

Try it out

This block shows the Swagger UI for a FastAPI application. It includes a sidebar with endpoints like '/show_map' and '/airlines_db', and a main area with detailed descriptions for each endpoint, including media types and example values. A red arrow points to the 'openapi.json' link at the top left.

FastAPI (0.1.0)

Show Map

Get Airlines Db

Get Airline Info

Get Airlines Info By Country

Get Airlines Summary By Country

Download OpenAPI specification Download

FastAPI (0.1.0)

Show Map

Responses

> 200 Successful Response

Get Airlines Db

Responses

> 200 Successful Response

Get Airline Info

Responses

> 200 Successful Response

GET /airline_info/{airline_name}

Response samples

200 Content type application/json null Copy

GET /airlines_db

Response samples

200 Content type application/json null Copy

GET /airlines_summary_by_country/{country_name}

API docs by Redocly

This block shows the ReDoc UI for the same FastAPI application. It has a clean, modern design with cards for each endpoint. Red arrows point to the 'Download OpenAPI specification' button in the first card and the 'Download' button in the second card.

The documentation

<http://127.0.0.1:8000/docs>

FastAPI 0.1.0 OAS 3.1

/openapi.json

default

GET /show_map Show Map

GET /airlines_db Get Airlines Db

GET /airline_info/{airline_name} Get Airline Info

Parameters

Name Description

airline_name * required
string
(path)

Execute

Clear

Responses

Curl

```
curl -X 'GET' \
      'http://127.0.0.1:8000/airline_info/air%20france' \
      -H 'accept: application/json'
```

Request URL
http://127.0.0.1:8000/airline_info/air%20france

Server response

Code Details

200

Response body

```
{
    "AIRLINE": "Air France",
    "COUNTRY": "France",
    "INFORMATION/N.AIRCRAFT": "214"
}
```

Responses

Code Description

200 Successful Response

Media type

application/json

Controls Accept header.

Example Value | Schema

"string"

404

Not Found

Media type

application/json

Example Value | Schema

```
{
    "message": "string"
}
```

① http://127.0.0.1:8000/airline_info/airfrance

{"404 - Warning!":"Airline 'airfrance' not found"}

Swagger Editor

File | Edit | Generate Server | Generate Client | About |

```
1 openapi: 3.1.0
2 info:
3   title: FastAPI project Airlines
4   version: 0.1.0
5   description: Get Airline Info
6   termsOfService: https://fastapi.tiangolo.com/
7   contact:
8     name: Tiago Carvalho
9     url: https://github.com/tiagocarvalho
10    email: tiago@carvalho.dev
11   license:
12     name: Apache 2.0
13     url: https://www.apache.org/licenses/LICENSE-2.0.html
14
15 operations:
16   show_map:
17     summary: Show Map
18     operationId: show_map_show_map_get
19     responses:
20       200:
21         description: Successful Response
22         content:
23           application/json:
24             schema: {}
25
26   airlines_db:
27     summary: Get Airlines Db
28     operationId: get_airlines_db_airlines_db_get
29     responses:
30       200:
31         description: Successful Response
32         content:
33           application/json:
34             schema: {}
35
36   airline_info:
37     summary: Get Airline Info
38     operationId: get_airline_info_airline_info_airline_name_get
39     parameters:
40       name: airline_name
41       in: path
42       required: true
43       schema:
44         type: string
45         title: Airline Name
46     responses:
47       200:
48         description: Successful Response
49         content:
50           application/json:
51             schema: {}
52
53   airlines_info_by_country:
54     summary: Get Airlines Info By Country
55     operationId: get_airlines_info_by_country_airlines_info_by_country_get
56     parameters:
57       country_name: string
58     responses:
59       200:
60         description: Successful Response
61         content:
62           application/json:
63             schema: {}
64
65   airlines_summary_by_country:
66     summary: Get Airlines Summary By Country
67     operationId: get_airlines_summary_by_country_airlines_summary_by_country_get
68     parameters:
69       country_name: string
70     responses:
71       200:
72         description: Successful Response
73         content:
74           application/json:
75             schema: {}
```

FastAPI project Airlines 0.1.0 OAS 3.1

default

GET /show_map Show Map

GET /airlines_db Get Airlines Db

GET /airline_info/{airline_name} Get Airline Info

GET /airlines_info_by_country/{country_name} Get Airlines Info By Country

GET /airlines_summary_by_country/{country_name} Get Airlines Summary By Country

Schemas

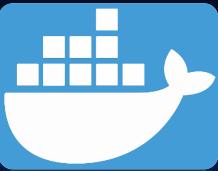
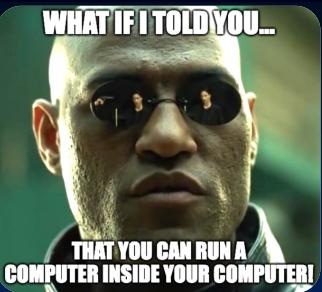
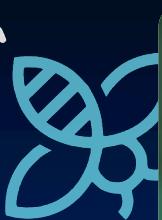
HTTPValidationError > Expand all object

Message > Expand all object

ValidationError > Expand all object

The editor Swagger

Containerization



https://hub.docker.com/r/laura1385/projectairlines_api

Screenshot of the Docker Hub repository page for `laura1385/projectairlines_api`.

Description
Docker image for Aircraft API project, part of my Data Science Master's thesis.

Last pushed: 2 days ago

Tags
This repository contains 1 tag(s).

Tag	OS	Type	Pulled	Pushed
0.1	Image		2 days ago	2 days ago

Docker commands
To push a new tag to this repository:
`docker push laura1385/projectairlines_api:tagname`

Automated Builds
Manually pushing images to Hub? Connect your account to GitHub or Bitbucket to automatically build and tag new images whenever your code is updated, so you can focus your time on creating.
Available with Pro, Team and Business subscriptions. [Read more about automated builds](#).

[See all](#) [Go to Advanced Image Management](#)

Docker's Playground

Session details:
IP: 192.168.0.13 | OPEN PORT
Memory
SSH: ssh ip172-18-0-17-ck84nmogftqg00eqvmp0@direct.labs.j...

Actions: CLOSE SESSION, Instances, ADD NEW INSTANCE, DELETE, EDITOR

```
# This is a sandbox environment. Using personal credentials is HIGHLY discouraged. Any consequences of doing so are completely the user's responsibilities.
# The FWD team.
#####
node1 (local) ip172-18-0-17-ck84nmogftqg00eqvmp0
$ docker run -it -p 80:8000 laura1385/projectairlines_api:0.1
$ curl localhost:8000
  % Total    % Received =========
```

Status: Downloaded newer image for laura1385/projectairlines_api:0.1
929721f14479ff041747e59495eb8d15f384c93a8dfd767cb9ae713b2e77a

Non sicuro | http://ip172-18-0-17-ck84nmogftqg00eqvmp0-8080.direct.labs.play-with-docker.com/docs

FastAPI 0.1.0 OAS 3.1

/openapi.json

default

GET /show_map Show Map

Future perspectives

Examples



More data...

From Json file to Db

Online publication



