API BOOTCAMP

Boost Academy #>/<> HACK A BOSS

Noviembre 2022

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Developer Evangelist
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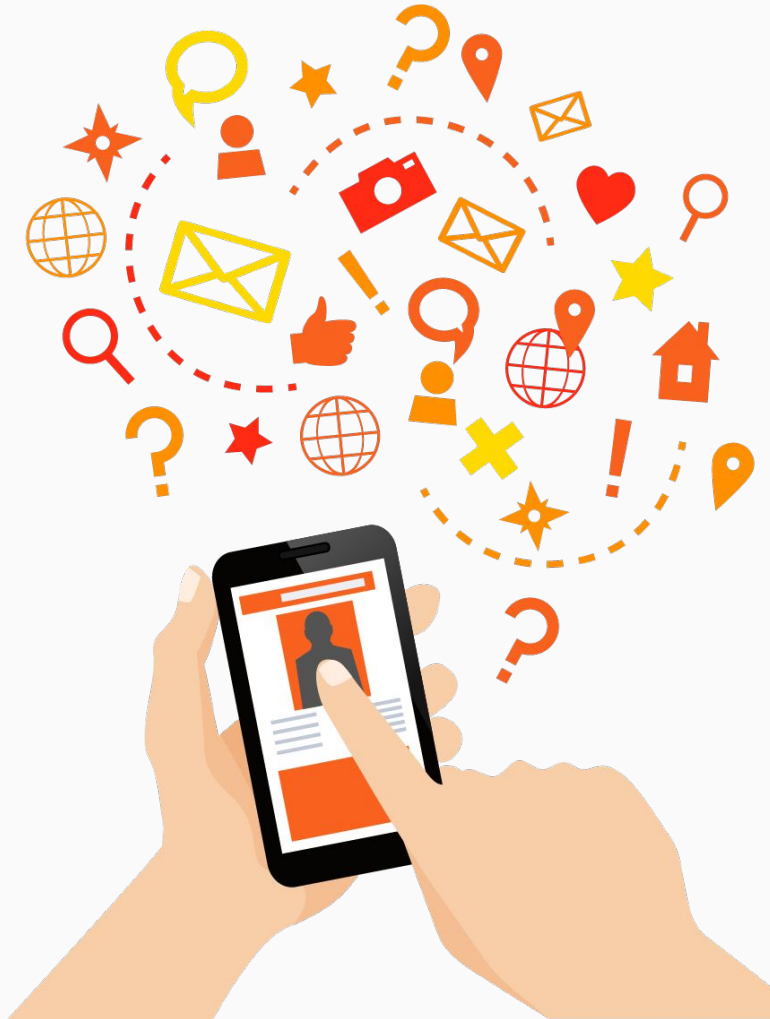

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I ❤ APIs

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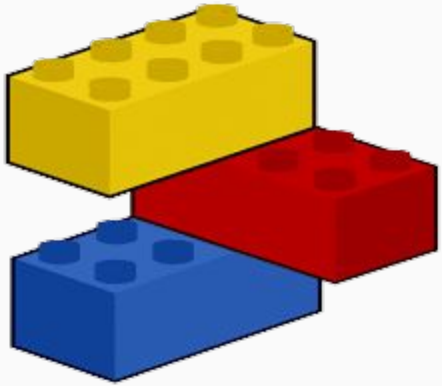

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02
API BASICS

03
EXPLORAR APIS

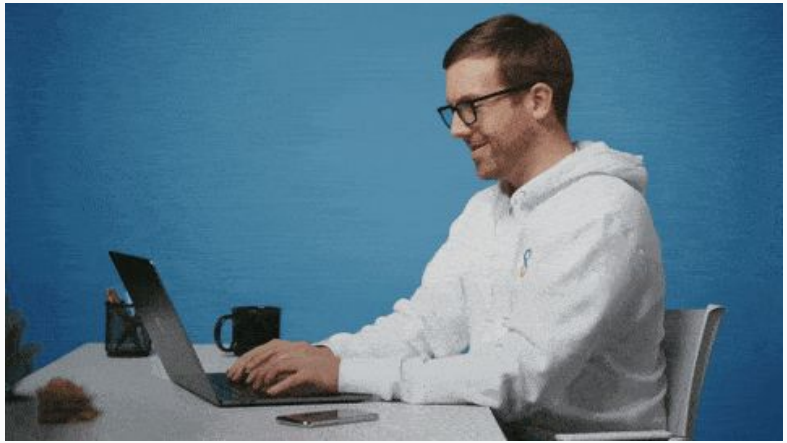
04
USAR APIS

05
DISEÑAR APIS

06
IMPLEMENTAR APIS

07
EJERCICIO FINAL

01.
PRESENTACIÓN



PRESENTACIÓN

Bienvenid@ al API Bootcamp:

- El propósito de este curso es comprender qué son las APIs, porque son tan importantes, aprender cómo explorar APIs y cómo usarlas para construir aplicaciones increíbles. Además aprenderemos a crear APIs y los aspectos principales de su ciclo de vida.
- ¿Por qué este curso? Las APIs están por todas partes y son un elemento fundamental de la mayoría de apps y plataformas que nos rodean. Como futuros desarrolladores espero que este curso os permita entender el concepto e incorporar las APIs como herramientas accesibles para vuestros futuros desarrollos.

- El Bootcamp está inspirado en el curso APIs for Beginners creado por Craig Dennis en la plataforma freecodecamp.org.

02.
API BASICS

¿QUÉ ES UNA API?

En esta sección cubriremos estos bloques:

- Definición de Interface.
- Definición de API.
- ¿Por qué son tan importantes?
- Web APIs.
- API Styles.
- APIs REST.

APPLICATION

PROGRAMMING

INTERFACE

DEFINICIÓN DE INTERFACE

DEFINICIÓN DE API

Python String Methods

‹ Previous Next ›

Python has a set of built-in methods that you can use on strings.

Note: All string methods returns new values. They do not change the original string.

Method	Description
capitalize()	Converts the first character to upper case
casefold()	Converts string into lower case
center()	Returns a centered string
count()	Returns the number of times a specified value occurs in a string
encode()	Returns an encoded version of the string
endswith()	Returns true if the string ends with the specified value
expandtabs()	Sets the tab size of the string

Python String upper() Method

‹ String Methods

Example

Upper case the string:

```
txt = "Hello my friends"

x = txt.upper()

print(x)
```

Try it Yourself »

https://www.w3schools.com/python/python_ref_string.asp

Las APIs hacen la vida más fácil a los developers

DEFINICIÓN DE API

DEFINICIÓN DE API

APIS EXPOSE
SOMETHING USEFUL

DEVELOPERS WRITE APPS
WHICH CONSUMES APIS

DEFINICIÓN DE API

UNIVERSAL

Como LEGO, las APIs son bloques de construcción universales. En este caso para la creación de Apps.

FÁCIL DE USAR

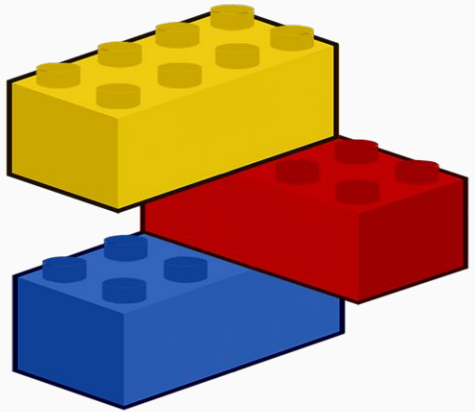
Como LEGO, las APIs tienen sus instrucciones y documentación para que sean fáciles de usar.

CONFIGURABLE

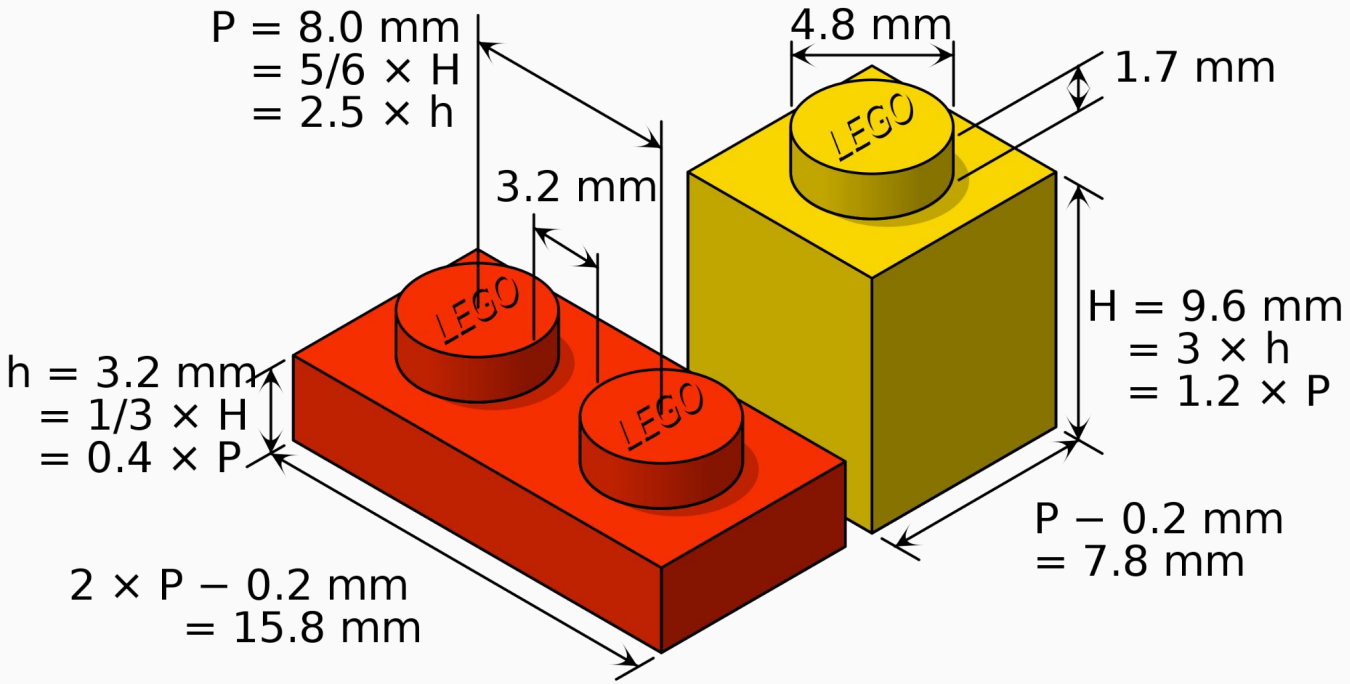
Como LEGO, las APIs dan la opción al usarlas de combinarlas para distintos casos de uso.

INNOVACIÓN

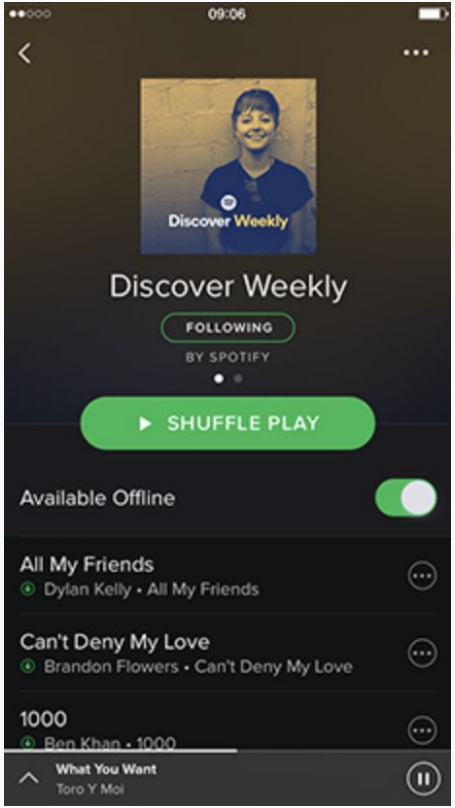
Como LEGO, las APIs permiten crear soluciones de altísimo valor ahorrando mucho tiempo.

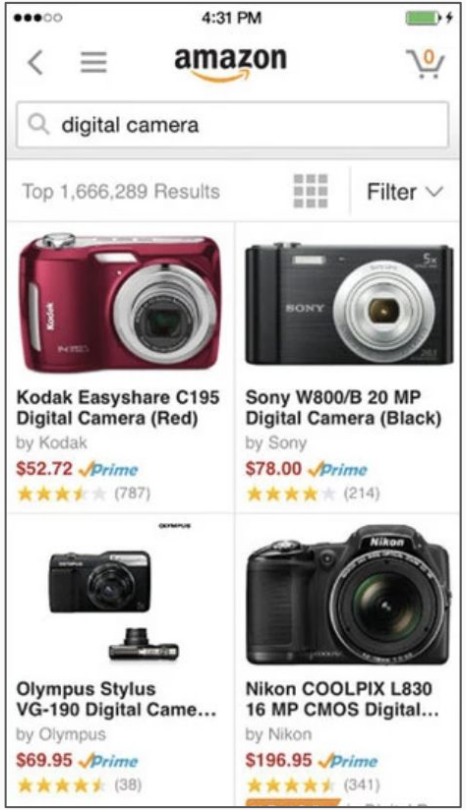


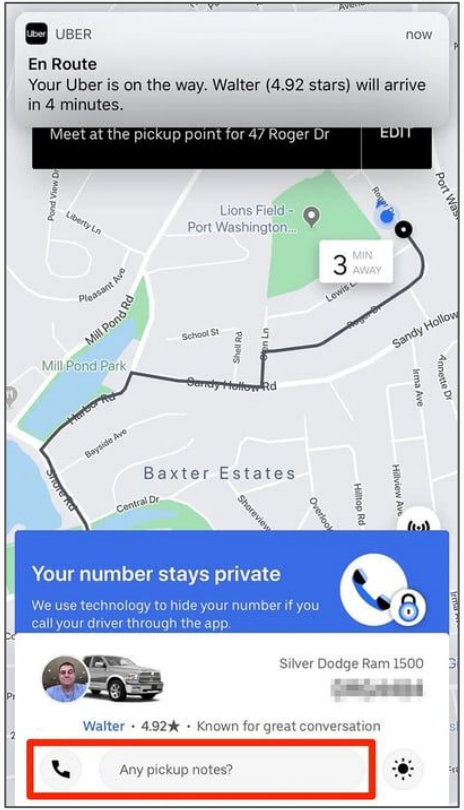
DEFINICIÓN DE API



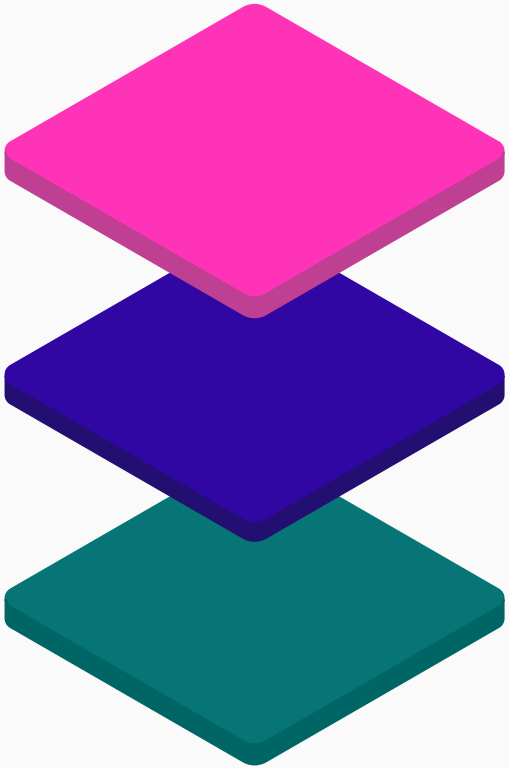
APIS ESTÁN EN TODAS PARTES





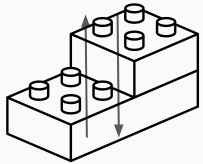


CÓMO FUNCIONAN LAS APIS



UI

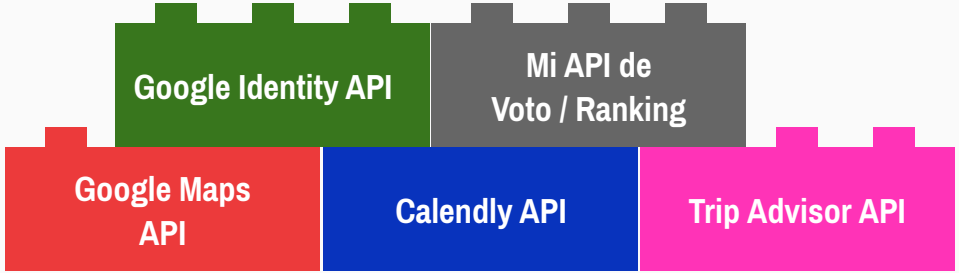
APIs



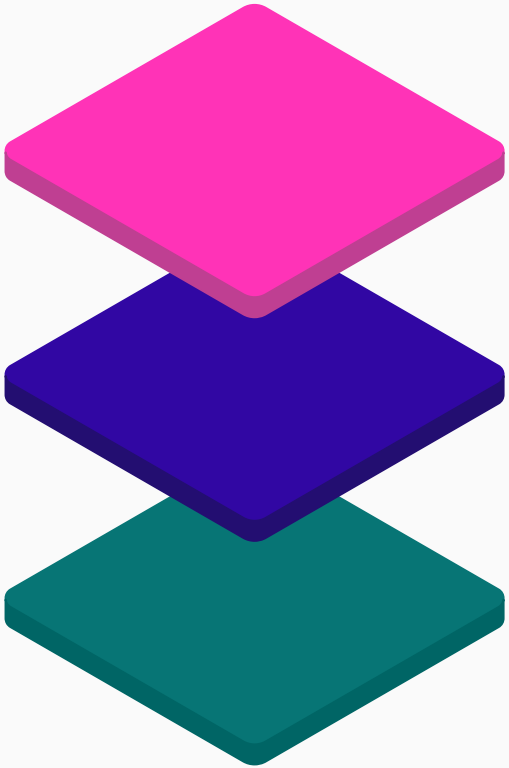
Servidor

Quiero crear una app que me muestre en el mapa los mejores restaurantes para celíacos y me permita: hacer un reserva, ver reviews de otros clientes y votar para crear un ranking.

CÓMO FUNCIONAN LAS APIS



CÓMO FUNCIONAN LAS APIS

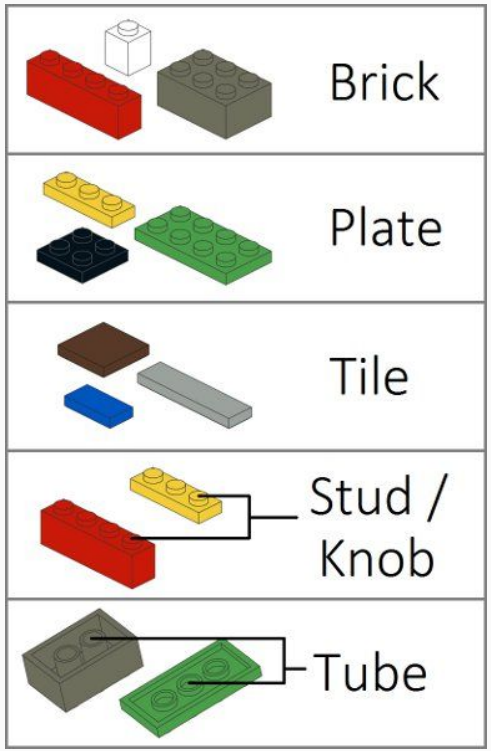


UI

APIs

Servidor

API STYLES



{REST API} REST

AsyncAPI

GraphQL

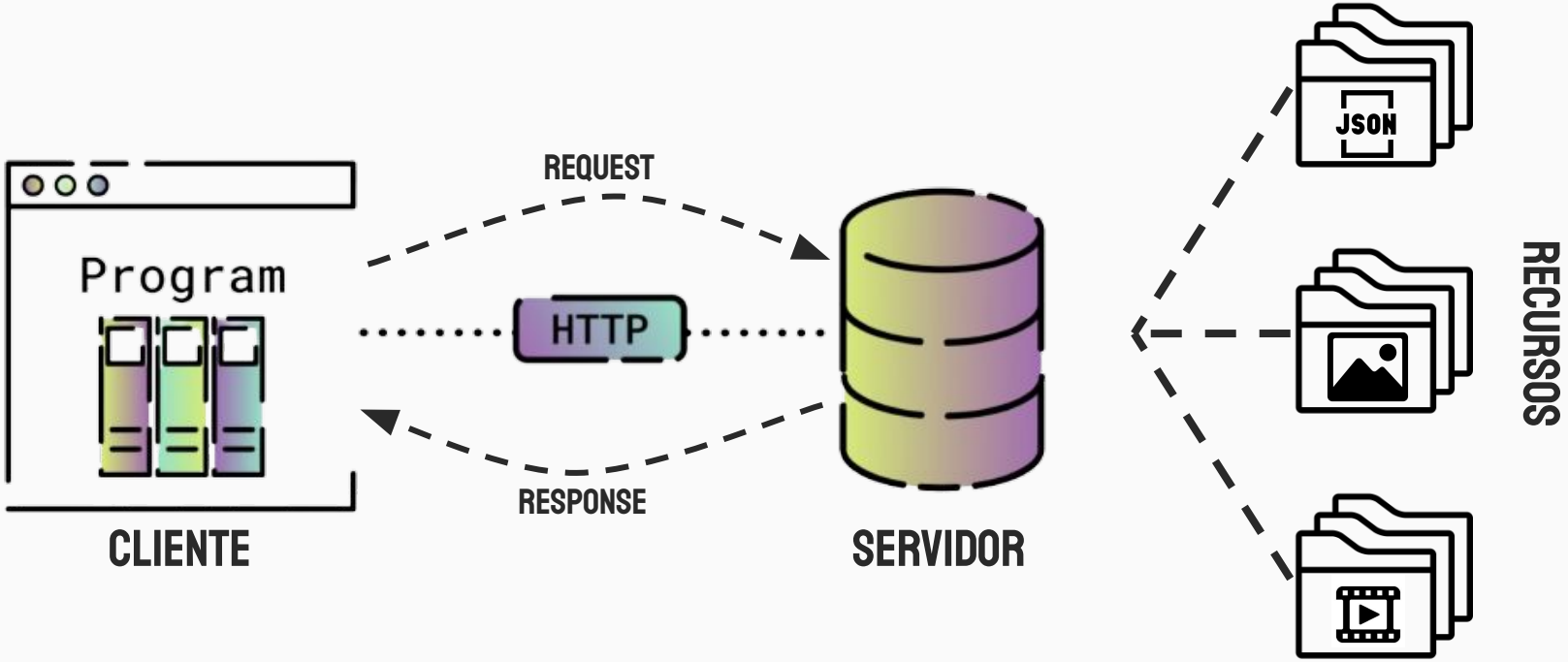
gRPC gRPC

webhooks Webhooks

SOAP Web Services

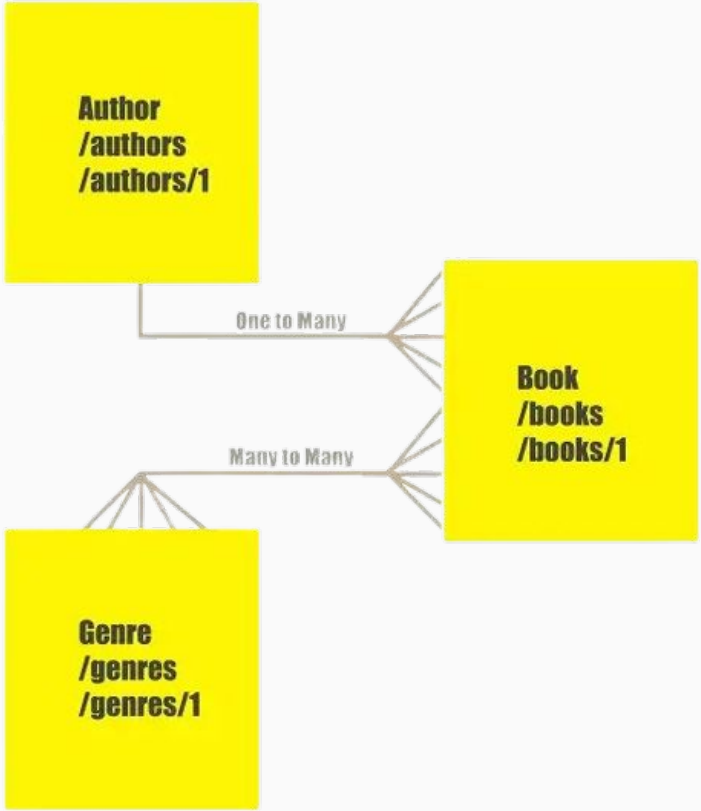
REST API

API REST



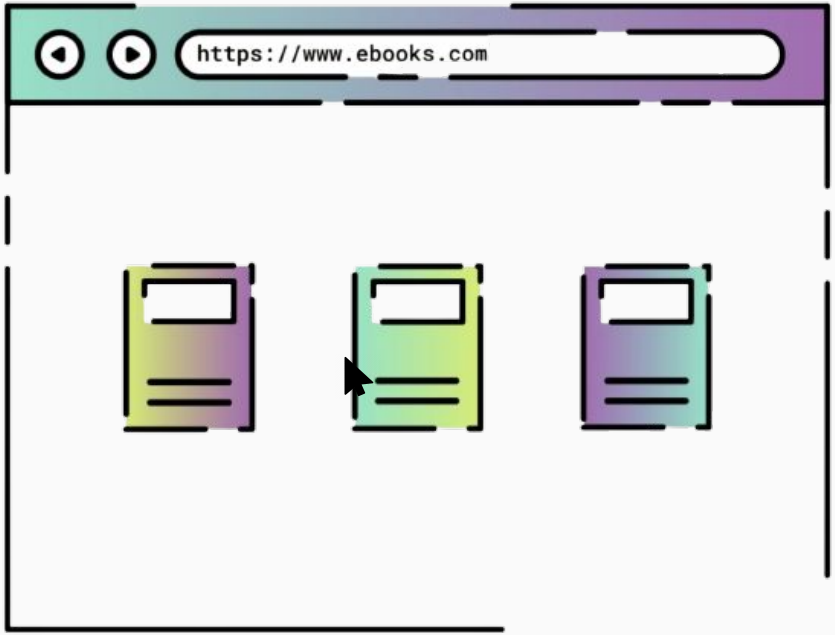
REST API

API REST



REST API

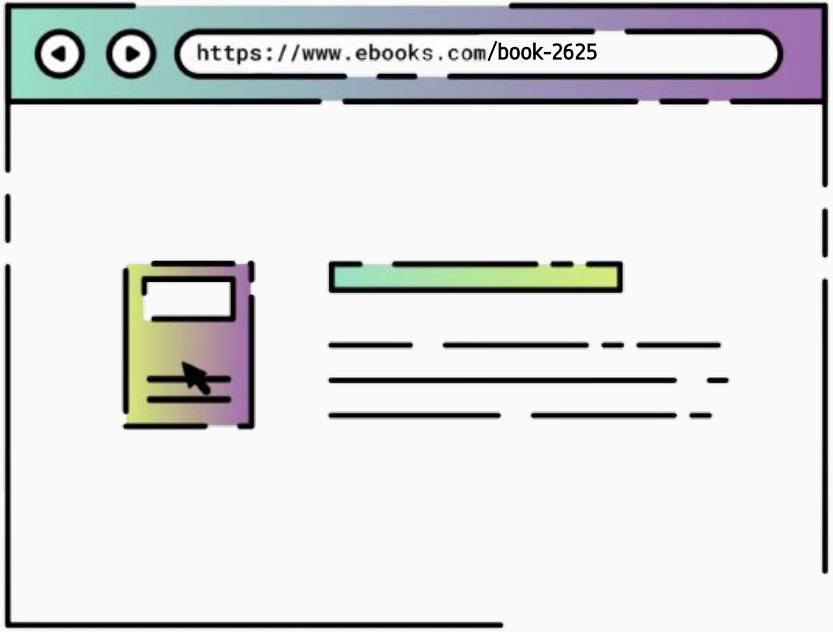
API REST



COLECCIÓN DE RECURSOS LIBROS

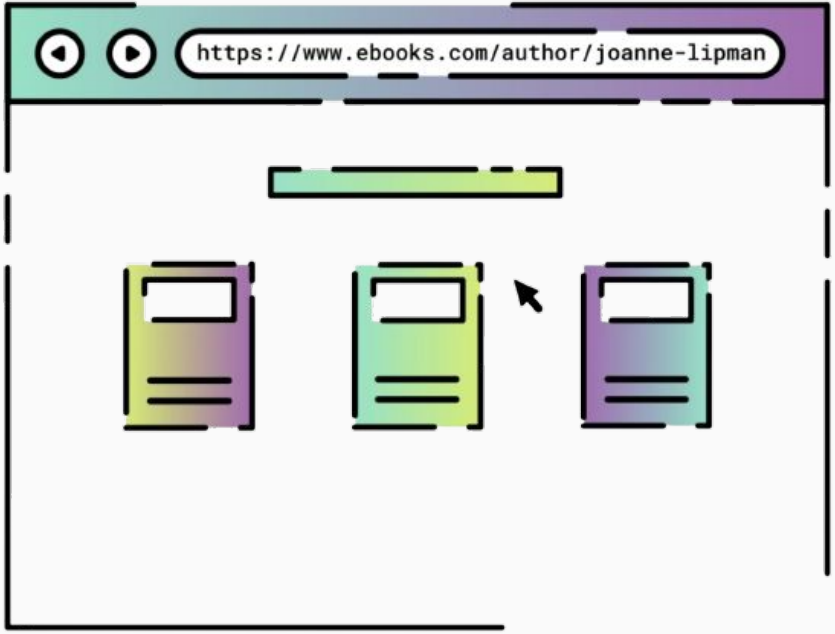
REST API

API REST



RECURSO LIBRO

API REST



RECURSO
AUTOR
COLECCION LIBROS

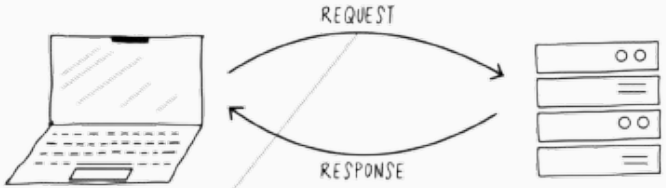
https://www.todostuslibros.com/

REST API

API REST

REST STANDS FOR REPRESENTATIONAL STATE TRANSFER

REST APIS OPERATE ON A SIMPLE REQUEST/RESPONSE SYSTEM



CLIENT CAN MAKE A REQUEST USING HTTP METHODS

THESE METHODS ARE:
GET, POST, PUT, PATCH, DELETE, HEAD, TRACE, OPTIONS, CONNECT

HTTP REQUEST CONTAINS

- REQUEST METHOD
- HTTP HEADERS
- BODY

SERVER RETURNS A RESPONSE WITH AN HTTP STATUS CODE

POPULAR HTTP STATUS CODE:
EX, 200, 202, 403, 404, 500 ETC

HTTP RESPONSE CONTAINS

- STATUS CODE
- HTTP HEADERS
- RESPONSE BODY

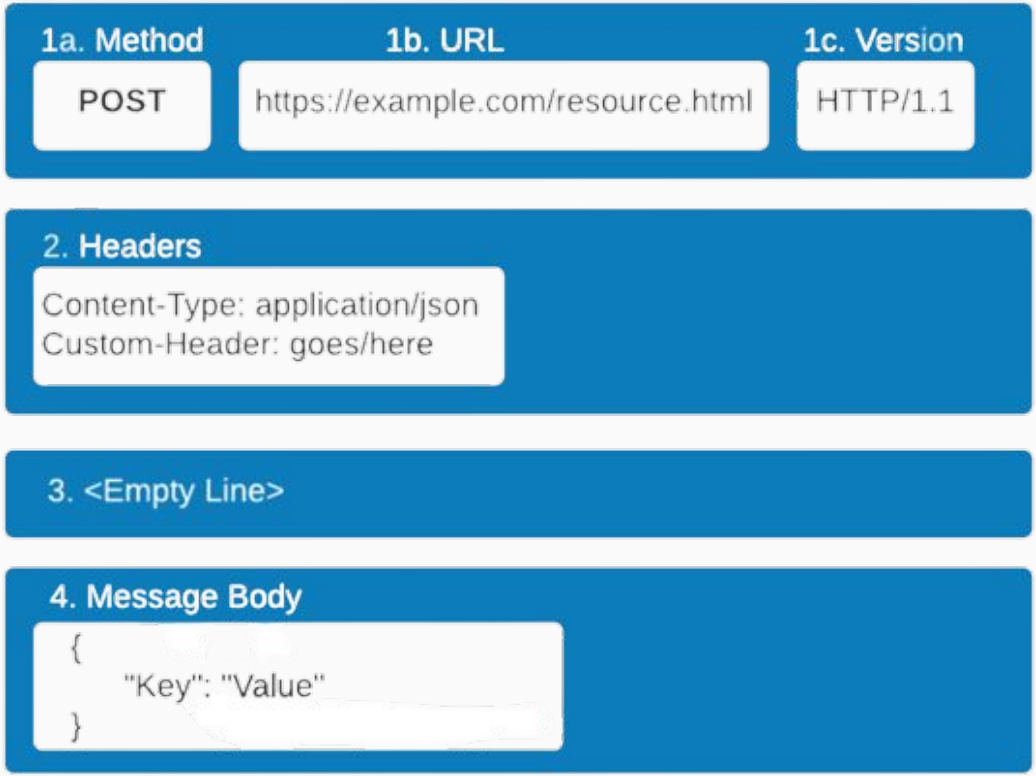
REST API

API REST

HTTP Verbs	CRUD
GET	Read
POST	Create
PUT	Update
PATCH	
DELETE	Delete

REST API

API REST



REST API

API REST

1a. Version HTTP/1.1

1b. Status Code 404

1c. Status Message Not Found

2. Headers

```
Content-Length: 1595
Content-Type: text/html
```

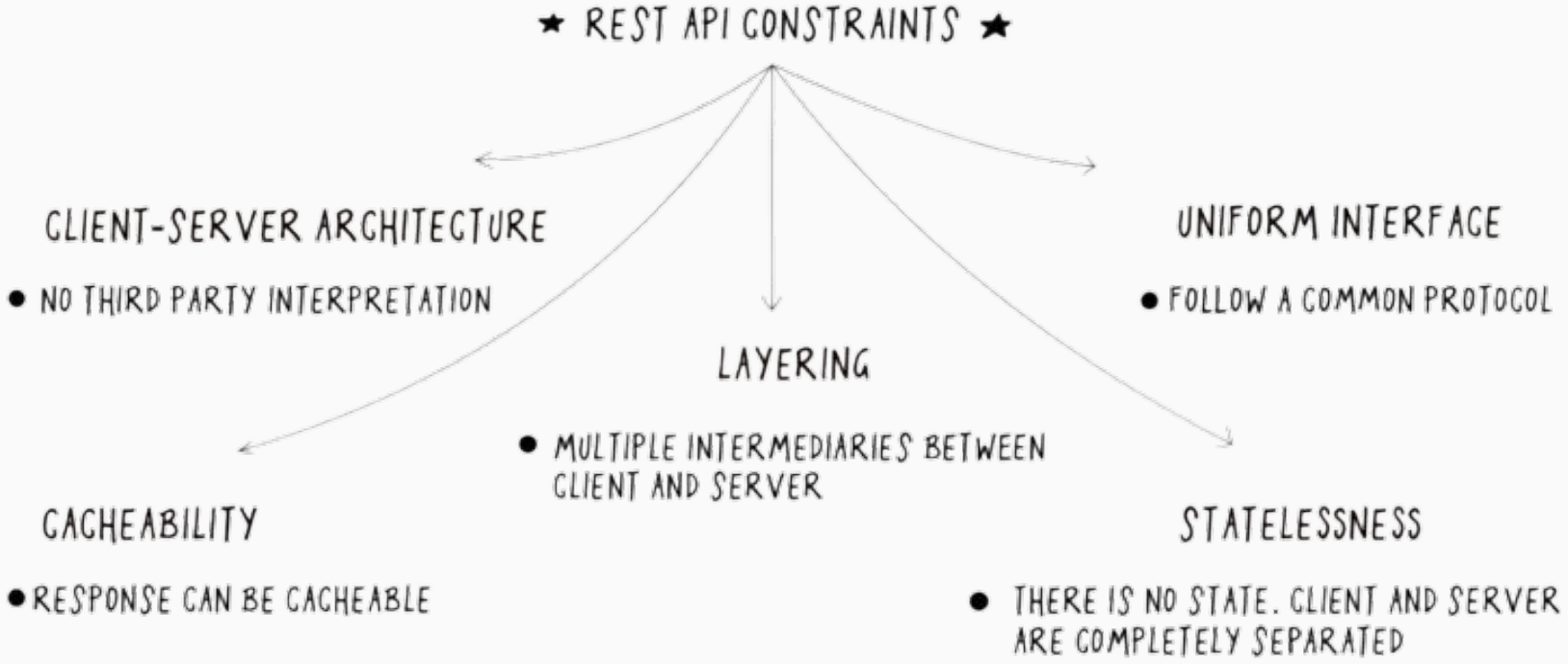
3. <Empty Line>

4. Message Body

```
<!DOCTYPE html>
<html lang=en>
  <title>Error 404 (Not Found)!!1</title>
```

REST API

API REST



API REST

- `GET /books`: get all the available books
- `POST /books`: create a new book 
- `GET /books/{id}`: get the details of a book with a specific ID
- `PUT /books/{id}`: update the details of a book with a specific ID 
- `DELETE /books/{id}`: delete a book with a specific ID 
- `GET /authors/{id}`: get the details of an author with a specific ID

REST API

API REST

Entrantes

Croquetas de espinacas con perla de mozarella ..... 10,00€
Croquetas de salmón y bacalao ..... 10,00€
Croquetas de boletus ..... 10,00€
Huevos rotos de corral con picadillo ..... 12,00€
Huevos rotos de corral con virutas de jamón ibérico ..... 13,00€
Revuelto de gabarreros (boletus, bacalao, piñones) ..... 12,00€
Timbal de mollejas con verduras crujientes ..... 16,00€
Jamón ibérico de bellota ..... 22,00€
Tempura de verdura con variedad de alioli ..... 12,00€
Morcilla de Cantimpalos frita ..... 10,00€
Jamón serrano de Segovia ..... 10,00€
Queso de oveja de Segovia ..... 10,00€
Chorizo de la olla ..... 10,00€
Alcachofas sobre crema de ajoblanco y chips de bacalao ..... 16,00€
Anchoas con pimientos de piquillo ..... 18,00€
Champiñon portobello relleno de secreto ibérico al P.X. ..... 14,00€
Empanadillas de morcilla, manzana y hierbabuena con salsa ali-brava ..... 12,00€
Ferrero Rocher de cochinillo con parmentier de jabugo asado ..... 15,00€
Bolita de risotto de boletus y foie con salsa ligera de queso y tocineta ibérica ahumada ..... 14,00€
Langostinos fritos con encebollado de tomate y cilantro ..... 16,00€

Ensaladas

Ensalada mixta ..... 9,00€
Ensalada de La Huerta ..... 7,00€
Milhoja tumbada de tomate y calabacin a la plancha con salsa pesto y escamas de queso de oveja ..... 14,00€
Ensaladilla de Txanguro con langostinos y mahonesa cítrica ..... 15,00€
Ensalada de presa ibérica escabechada con vinagreta de frambuesa ..... 15,00€
Ensalada Thai con langostinos a la plancha con dados de mango y crujiente de patata ..... 16,00€
Ensalada de rúcula con tomate y taco de bonito escabechado al jerez ..... 19,00€

Con el fin de informar a nuestros clientes sobre las posibles alergias e intolerancias de nuestros alimentos, incluimos una relación de nuestros platos y su posible manifestación alérgica. Recomendamos consultar con nuestro personal cualquier duda o intolerancia.

Sopas y plato cuchara

Sopa castellana ..... 7,00€
Judiones ..... 10,00€
Gazpacho (temporada) ..... 9,00€
Crema de calabaza y jengibre ..... 9,00€

Todo Bacalao

Pimientos rellenos de bacalao al ajillo y espinacas con salsa vizcaina ..... 12,00€
Taquitos de bacalao rebozado sobre patata revolcona y salsa suave de longaniza ..... 16,00€
Callos de bacalao con chipirones a la marinera ..... 16,00€
Suprema de bacalao gratinado con all-oli y frutos rojos ..... 20,00€
Lomo de bacalao con salsa de ciruelas rojas ..... 20,00€

Pescados

Corvina a la plancha sobre lecho de verduras, algas wakame y salsa de coco ..... 20,00€
Lomo de rodaballo sobre tilas de tocineta y cebolla frita acompañado de dados de mango y calabacin braseado ..... 22,00€
Lubina salvaje con mahonesa de soja, cebolla morada encurtida y patata confitada ..... 24,00€
Merluza a la cazuela con mejillones y alcachofas ..... 20,00€

Carnes y Asados

Cochinillo asado marca de garantia ..... 22,00€
Cordero asado 1/4 (dos personas) ..... 44,00€
Chuletillas de lechal a la plancha ..... 20,00€
Lomo de choto a la plancha con salsa a la pimienta y guarnición ..... 18,00€
Solomillo de choto con salsa foie ..... 24,00€
Carrillera de ternera con puré cremoso de patata, cebollita crujiente y zanahoria ..... 20,00€
Secreto ibérico relleno de queso curado, pimientos al ron y salsa oporto ..... 20,00€
Carpaccio de buey con escamas de queso curado de Espirdo, piñones y helado de chimichurri ..... 18,00€
Lagarto ibérico a la plancha con salsa de setas de temporada y pastel de batata y bacón ..... 20,00€
Deshuesado de cochinillo sobre manzana confitada, cebolla y parmentier de boniato ..... 20,00€
Jarrete de cordero asado a baja temperatura con cremoso de patata ..... 20,00€

Available endpoints

Tweets	Post, retrieve, and engage with Tweets
	Get Tweet timelines
	Curate a collection of Tweets
	Search Tweets: 7 day*
	Filter realtime Tweets
	Sample realtime Tweets
Users	Manage account settings and profile
	Mute, block, and report users
	Follow, search, and get users
	Create and manage lists
	User profile images and banners
Direct Messages	Sending and receiving events
	Welcome Messages
	Message attachments
	Quick Replies
	Buttons
	Typing indicator and read receipts
	Conversation management

benjagm

Carta https://restaurantecasares.com/

API methods https://developer.twitter.com/en/docs/twitter-api/v1

03.
EXPLORANDO APIS

EXPLORANDO APIS

En esta sección cubriremos estos bloques:

- Explorando APIs Online.
  - Spotify for Developers
  - Spotify - Search API {BETA}

- Explorando APIs desde la línea de comandos con CURL.
  - Twilio
  - Twilio Console

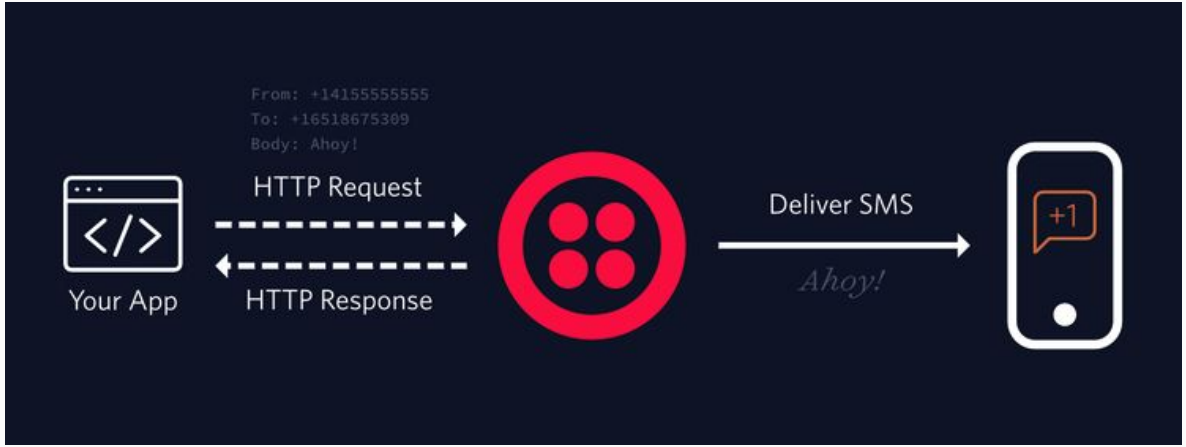
- Explorando APIs con Postman.
  https://jsonplaceholder.typicode.com/

04.
USANDO APIS

USANDO APIS

En esta sección cubriremos estos bloques:

- Que es un SDK
- Introducción al SDK de Twilio Messaging para Python.
- Aplicación de ejemplo en la que implementar un envío de SMS usando la API y el SDK de Twilio. https://www.twilio.com/docs/sms/quickstart/python



QUE ES UN SDK

DECLARAR UN CLIENTE HTTP PARA CADA LLAMADA CON TODO LO QUE ACARREA ES CANSINO

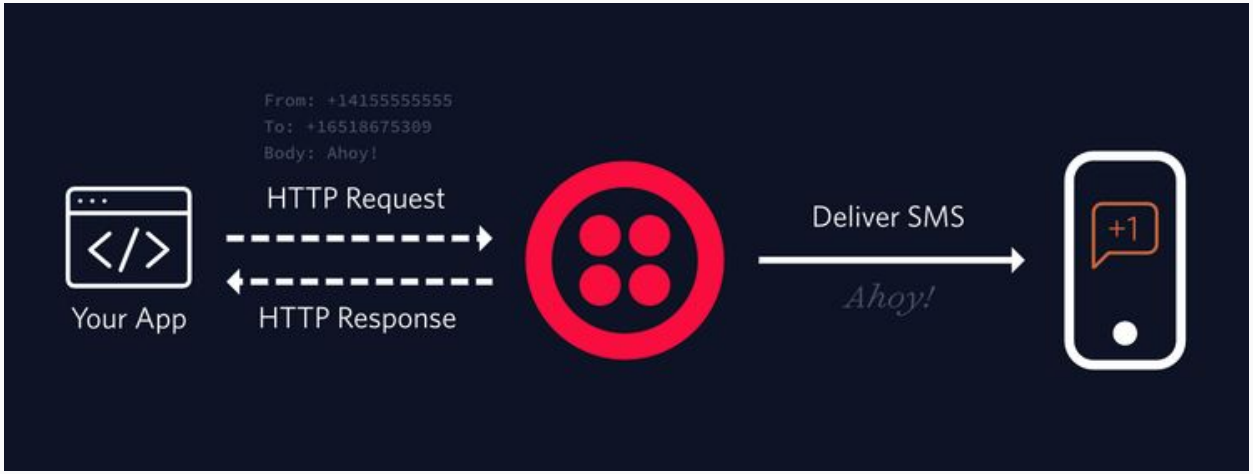
```
import python_http_client

global_headers = {"Authorization": "Bearer XXXXXXX"}
client = Client(host='base_url', request_headers=global_headers)
query_params = {"hello":0, "world":1}
request_headers = {"X-Test": "test"}
data = {"some": 1, "awesome": 2, "data": 3}
response = client.your.api._(param).call.post(request_body=data,
                                              query_params=query_params,
                                              request_headers=request_headers)

print(response.status_code)
print(response.headers)
print(response.body)
```

QUE ES UN SDK

```python
from twilio.rest import Client

# put your own credentials here
account_sid = "ACc34dc91ef3e06c3ab9090d4f15f50948"
auth_token = "6118b5af92d39b1deb98abe05fd23725"

client = Client(account_sid, auth_token)

message= client.messages.create(
    to="use your number given when registration",
    from_="use the free number ",
    body="This is the ship that made the Kessel Run in fourteen parsecs?"
)
```

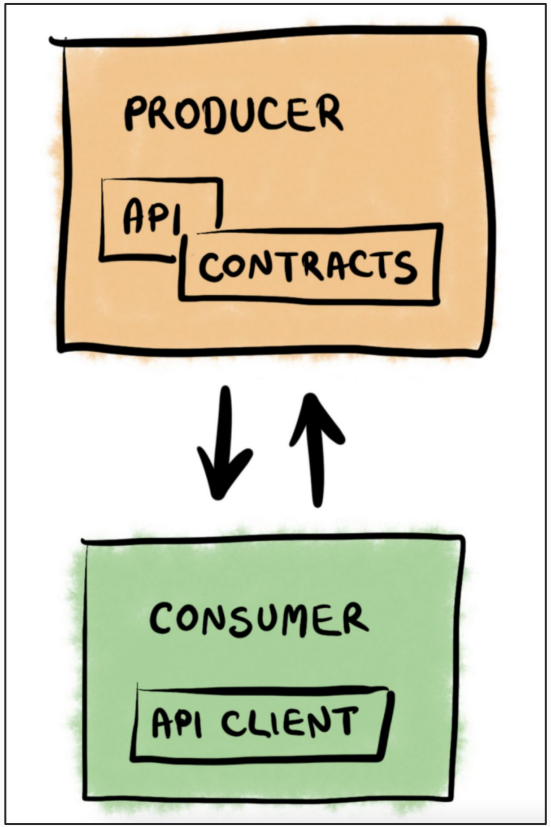
USANDO UN SDK

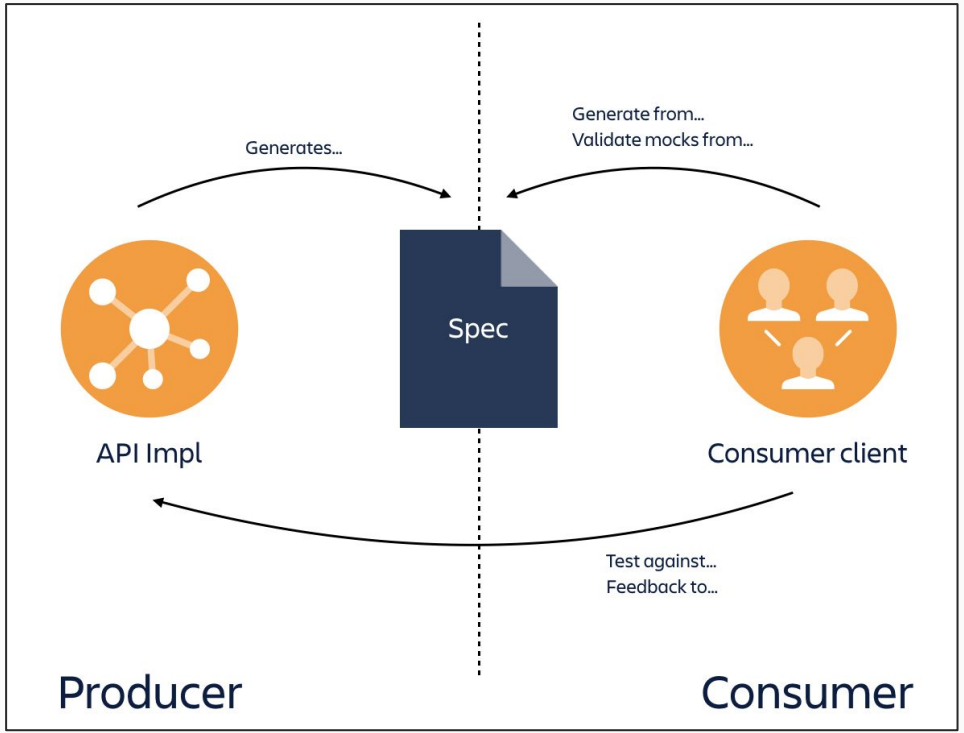
Aplicación de ejemplo en la que implementar un envío de SMS usando la API y el SDK de Twilio.



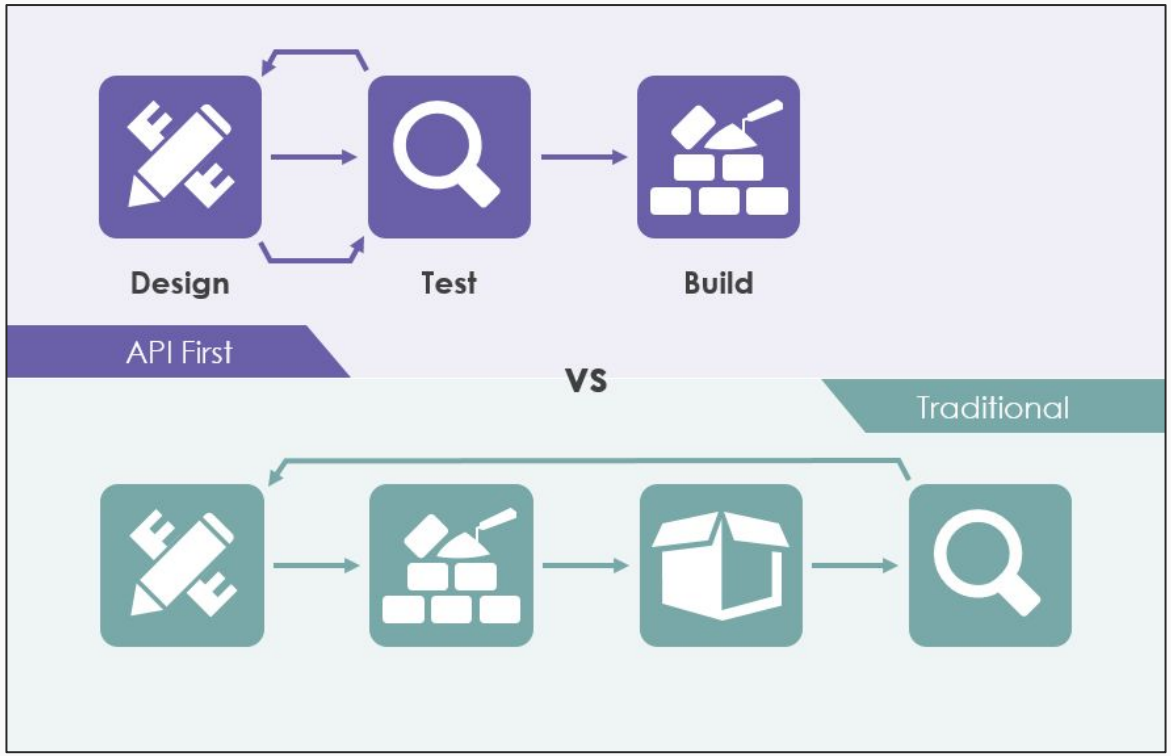
05.
DISEÑAR APIS

PRODUCERS VS CONSUMERS





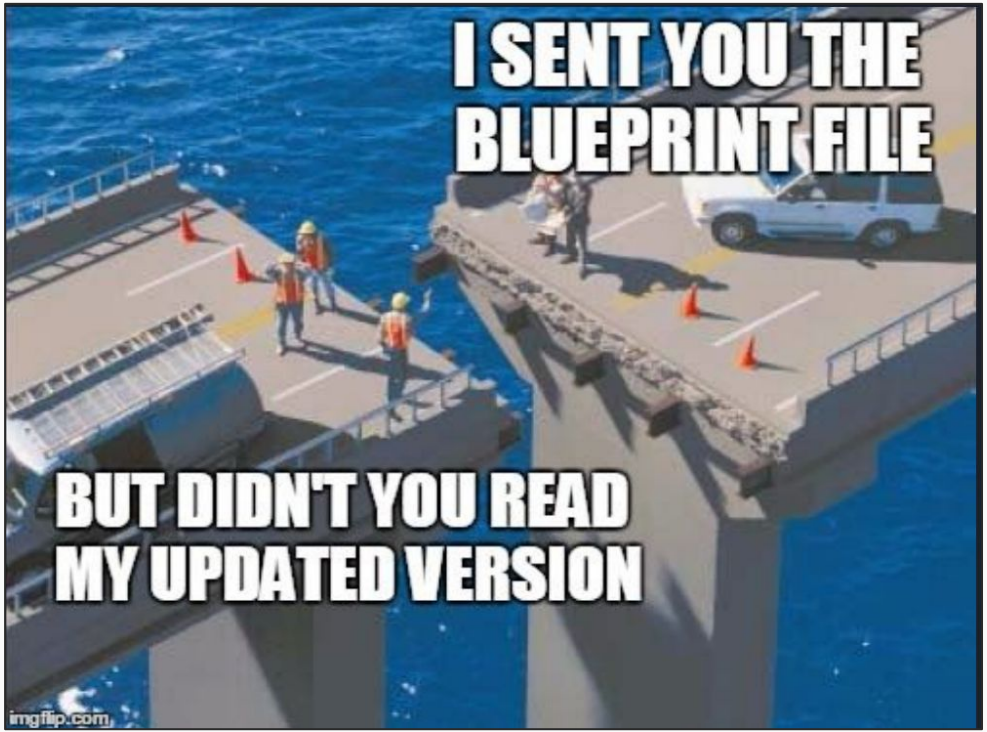
API-FIRST VS CODE-FIRST



API first 👍

VS

Code first 🤞

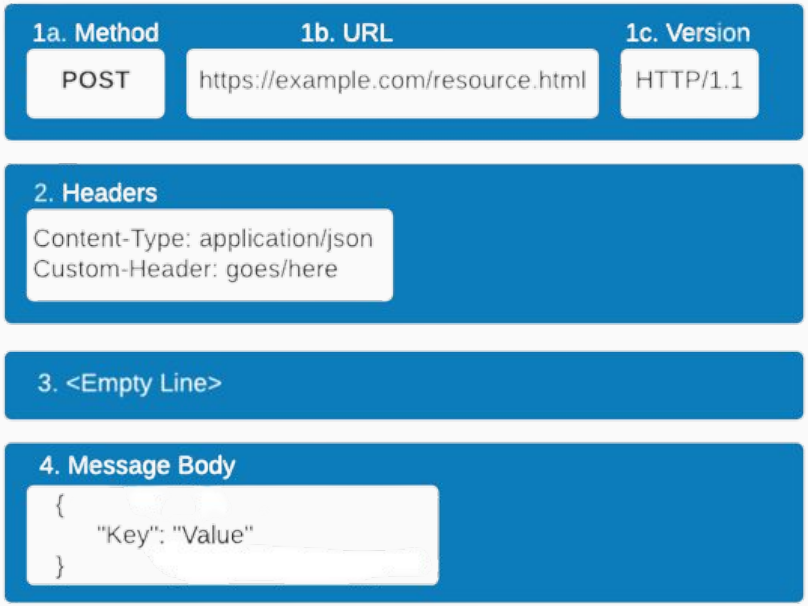


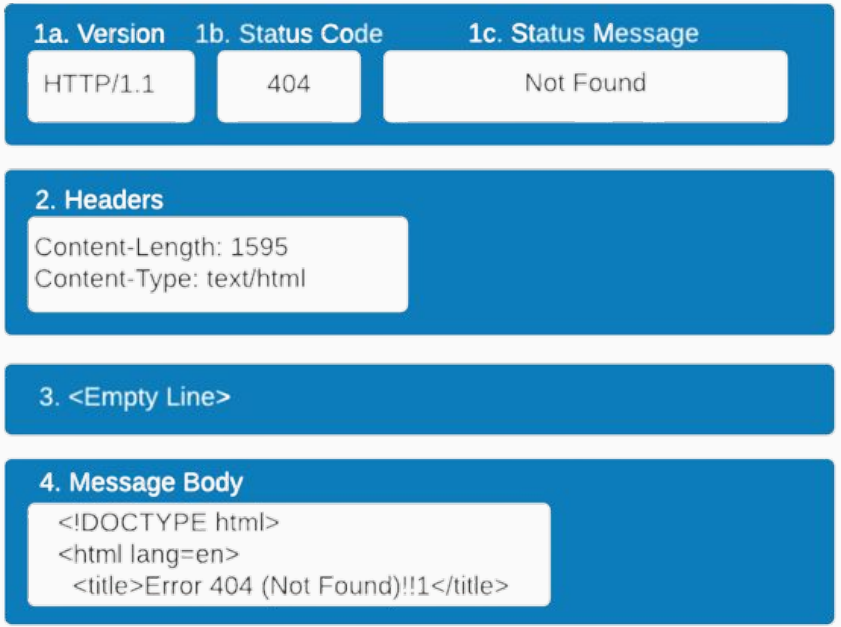
API DESIGN

- ARQUETIPOS DE RECURSOS
- URIS
- NOMENCLATURA DE RECURSOS
- FORMATOS DE MENSAJE
- MÉTODOS HTTP
- CABECERAS
- PARAMETROS
- VERSIONADO
- EJEMPLO

REST API

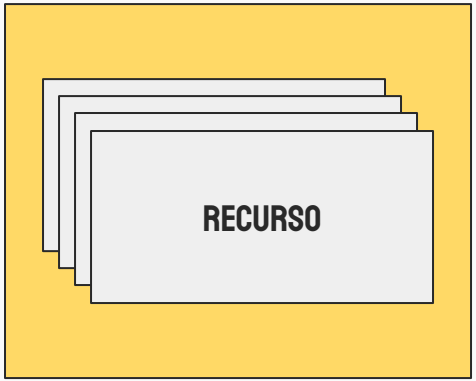
REQUEST RESPONSE





benjagm

ARQUETIPOS RECURSOS



COLLECTION
***STORE**

http://myapi.com/**books**

DOCUMENT

http://myapi.com/books/**1**

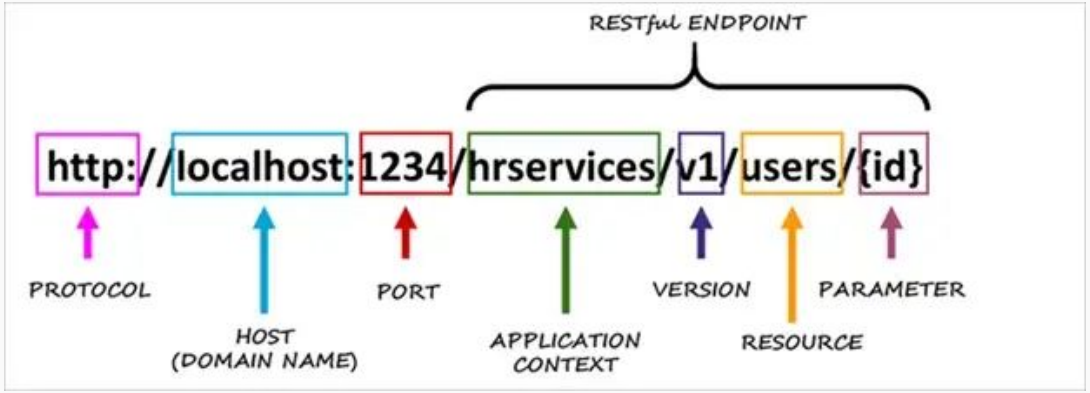
CONTROLLER

http://myapi.com/me/**unlock**

http://uniknow.github.io/AgileDev/site/0.1.9-SNAPSHOT/parent/rest/resource-archetypes.html

URIS

RFC 3986



RESOURCES NAMING

2. Best Practices

2.1. Use nouns to represent resources

RESTful URI should refer to a resource that is a thing (noun) instead of referring to an action (verb) because nouns have properties that verbs do not have – similarly, resources have attributes. Some examples of a resource are:

- Users of the system
- User Accounts
- Network Devices etc.

and their resource URIs can be designed as below:

```
http://api.example.com/device-management/managed-devices
http://api.example.com/device-management/managed-devices/{device-id}
http://api.example.com/user-management/users
http://api.example.com/user-management/users/{id}
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.1.1. document

A document resource is a singular concept that is akin to an object instance or database record.

In REST, you can view it as a single resource inside resource collection. A document's state representation typically includes both fields with values and links to other related resources.

Use "singular" name to denote document resource archetype.

```
http://api.example.com/device-management/managed-devices/{device-id}
http://api.example.com/user-management/users/{id}
http://api.example.com/user-management/users/admin
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.1.2. collection

A collection resource is a server-managed directory of resources.

Clients may propose new resources to be added to a collection. However, it is up to the collection resource to choose to create a new resource or not.

A collection resource chooses what it wants to contain and also decides the URIs of each contained resource.

Use the “plural” name to denote the collection resource archetype.

```
http://api.example.com/device-management/managed-devices
http://api.example.com/user-management/users
http://api.example.com/user-management/users/{id}/accounts
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.1.3. store

A store is a client-managed resource repository. A store resource lets an API client put resources in, get them back out, and decide when to delete them.

A store never generates new URIs. Instead, each stored resource has a URI. The URI was chosen by a client when the resource initially put it into the store.

Use “plural” name to denote store resource archetype.

```
http://api.example.com/song-management/users/{id}/playlists
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.1.4. controller

A controller resource models a procedural concept. Controller resources are like executable functions, with parameters and return values, inputs, and outputs.

Use “verb” to denote controller archetype.

```
http://api.example.com/cart-management/users/{id}/cart/checkout http://api.example.com/song-management/users/{id}/playlist/play
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.1.4. controller

A controller resource models a procedural concept. Controller resources are like executable functions, with parameters and return values, inputs, and outputs.

Use “verb” to denote controller archetype.

```
http://api.example.com/cart-management/users/{id}/cart/checkout http://api.example.com/song-management/users/{id}/playlist/play
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.2. Consistency is the key

Use consistent resource naming conventions and URI formatting for minimum ambiguity and maximum readability and maintainability. You may implement the below design hints to achieve consistency:

2.2.1. Use forward slash (/) to indicate hierarchical relationships

The forward-slash (/) character is used in the path portion of the URI to indicate a hierarchical relationship between resources. e.g.

```
http://api.example.com/device-management
http://api.example.com/device-management/managed-devices
http://api.example.com/device-management/managed-devices/{id}
http://api.example.com/device-management/managed-devices/{id}/scripts
http://api.example.com/device-management/managed-devices/{id}/scripts/{id}
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.2.2. Do not use trailing forward slash (/) in URIs

As the last character within a URI's path, a forward slash (/) adds no semantic value and may confuse. It's better to drop it from the URI.

```
http://api.example.com/device-management/managed-devices/ http://api.example.com/device-management/managed-devices  /*This is much better version*/
```

2.2.3. Use hyphens (-) to improve the readability of URIs

To make your URIs easy for people to scan and interpret, use the hyphen (-) character to improve the readability of names in long path segments.

```
http://api.example.com/device-management/managed-devices/
http://api.example.com/device-management/managed-devices   /*This is much better version*/
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.3. Do not use file extensions

File extensions look bad and do not add any advantage. Removing them decreases the length of URIs as well. No reason to keep them.

Apart from the above reason, if you want to highlight the media type of API using file extension, then you should rely on the media type, as communicated through the `Content-Type` header, to determine how to process the body's content.

```
http://api.example.com/device-management/managed-devices.xml  /*Do not use it*/
http://api.example.com/device-management/managed-devices   /*This is correct URI*/
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.4. Never use CRUD function names in URIs

We should not use URIs to indicate a CRUD function. URIs should only be used to uniquely identify the resources and not any action upon them.

We should use HTTP request methods to indicate which CRUD function is performed.

```
HTTP GET http://api.example.com/device-management/managed-devices  //Get all devices
HTTP POST http://api.example.com/device-management/managed-devices  //Create new Device

HTTP GET http://api.example.com/device-management/managed-devices/{id}  //Get device for given Id
HTTP PUT http://api.example.com/device-management/managed-devices/{id}  //Update device for given Id
HTTP DELETE http://api.example.com/device-management/managed-devices/{id}  //Delete device for given Id
```

https://restfulapi.net/resource-naming/

RESOURCES NAMING

2.5. Use query component to filter URI collection

Often, you will encounter requirements where you will need a collection of resources sorted, filtered, or limited based on some specific resource attribute.

For this requirement, do not create new APIs – instead, enable sorting, filtering, and pagination capabilities in resource collection API and pass the input parameters as query parameters. e.g.

```
http://api.example.com/device-management/managed-devices
http://api.example.com/device-management/managed-devices?region=USA
http://api.example.com/device-management/managed-devices?region=USA&brand=XYZ
http://api.example.com/device-management/managed-devices?
region=USA&brand=XYZ&sort=installation-date
```

https://restfulapi.net/resource-naming/

2.2.4. Do not use underscores (_)

It's possible to use an underscore in place of a hyphen to be used as a separator – But depending on the application's font, it is possible that the underscore (_) character can either get partially obscured or completely hidden in some browsers or screens.

To avoid this confusion, use hyphens (-) instead of underscores (_).

```
http://api.example.com/inventory-management/managed-entities/{id}/install-script-location  //More readable

http://api.example.com/inventory-management/managedEntities/{id}/installScriptLocation  //Less readable
```

2.2.5. Use lowercase letters in URIs

When convenient, lowercase letters should be consistently preferred in URI paths.

```
http://api.example.org/my-folder/my-doc       //1
HTTP://API.EXAMPLE.ORG/my-folder/my-doc     //2
http://api.example.org/My-Folder/my-doc       //3
```

FORMATOS DE MENSAJE DE LLAMADA Y RESPUESTA

Los formatos más habituales de mensaje son:

- **Plain**: application/json, application/json
- **Vendor specific**: e.g. application/vnd.github.v3+json
- **Standard/Hipermedia**: e.g. HAL, Collection+JSON or JSON-API, Siren, etc.

Nomenclatura de atributos en mensajes de tipo JSON: Es clave la consistencia. Para toda la API debe usarse el mismo formato:

- **myIdentifier : Camel case (e.g. in java variable names)**
- MyIdentifier : Capital camel case (e.g. in java class names)
- my_identifier : Snake case (e.g. in python variable names)
- my-identifier : Kebab case (e.g. in racket names)
- myidentifier : Flat case (e.g. in java package names)

Mi recomendación es usar Camel case.

PLAIN MEDIA TYPES

Type application:
- application/json
- application/xml
- application/zip

Type audio:
- audio/mpeg

Type image:
- image/gif
- image/jpeg
- image/png

Type multipart:
- multipart/mixed
- multipart/form-data

Type text:
- text/csv
- text/xml

Type video:
- video/mpeg
- video/mp4

FORMATOS DE MENSAJE DE LLAMADA Y RESPUESTA

```
{
    "item": {
        "id": "1234",
        "title": "Table made from unicorns",
        "description": "White table made of happiness: width 75 cm,
height: 73 cm, Max weight: 50 kg",
        "link": "https://www.example.com/tables/unicorn/fancy",
        "availability": "in stock",
        "price": {
            "value": "399.67",
            "currency": "EUR"
        },
        "color": "rainbow"
    }
}
```

METODOS HTTP

HTTP Verbs	CRUD
GET	Read
* POST	Create
PUT	Update
PATCH	
DELETE	Delete

* POST también se usa para los endpoints de tipo **controller**:

POST http://api.example.com/song-management/users/{id}/playlist/**play**

CABECERAS

Headers

The REST headers and parameters contain a wealth of information that can help you track down issues when you encounter them. HTTP Headers are an important part of the API request and response as they represent the meta-data associated with the API request and response. Headers carry information for:

1. Request and Response Body
2. Request Authorization
3. Response Caching
4. Response Cookies

Other than the above categories HTTP headers also carry a lot of other information around HTTP connection types, proxies etc. Most of these headers are for management of connections between client, server and proxies and do not require explicit validation through testing.

Headers are mostly classified as request headers and response headers, know the major request and response headers. You will have to set the request headers when you are sending the request for testing an API and you will have to set the assertion against the response headers to ensure that right headers are being returned.

The headers that you will encounter the most during API testing are the following, you may need to set values for these or set assertions against these headers to ensure that they convey the right information and everything works fine in the API:

Authorization: Carries credentials containing the authentication information of the client for the resource being requested.

WWW-Authenticate: This is sent by the server if it needs a form of authentication before it can respond with the actual resource being requested. Often sent along with a response code of 401, which means 'unauthorized'.

Accept-Charset: This is a header which is set with the request and tells the server about which character sets are acceptable by the client.

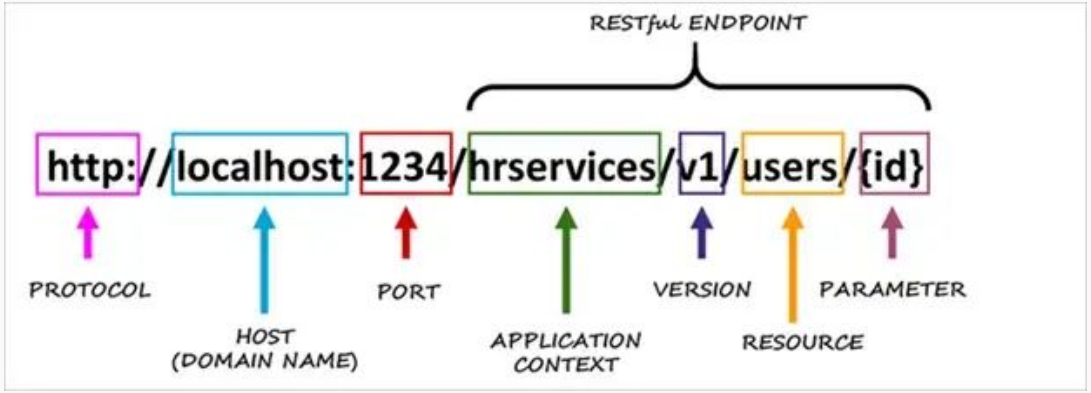
Content-Type: Indicates the media type (text/html or text/JSON) of the response sent to the client by the server, this will help the client in processing the response body correctly.

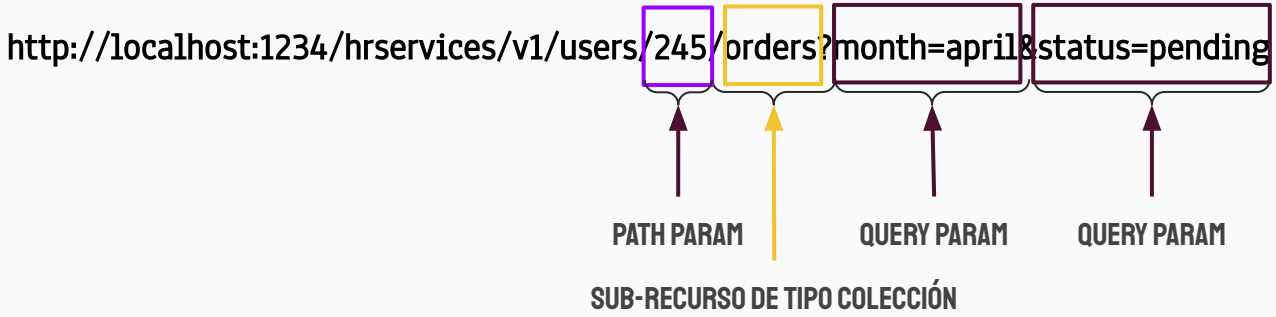
Cache-Control: This is the cache policy defined by the server for this response, a cached response can be stored by the client and re-used till the time defined by the Cache-Control header.

PATH PARAMETERS VS QUERY PARAMETERS

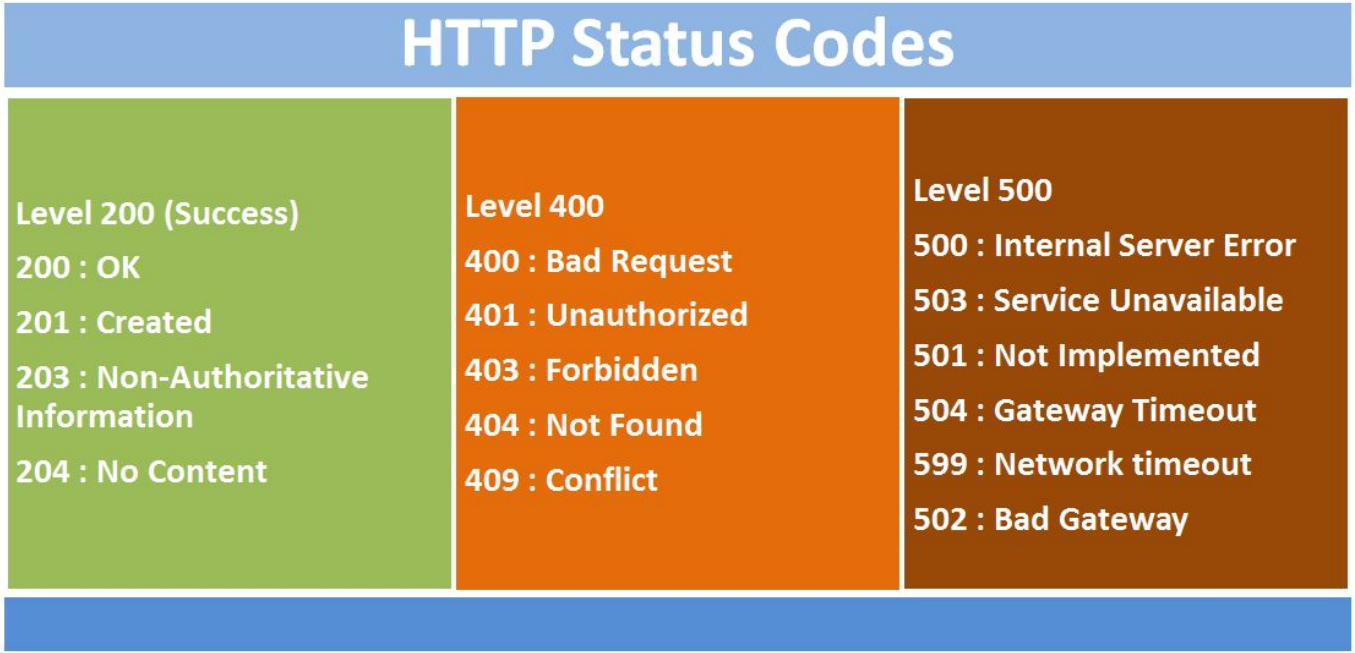
Los parámetros PATH se usan para identificar recursos o sub-recursos.

Los parámetros de QUERY son parámetros de entrada que se pasan a las operaciones para filtrar, ordenar o informar otras opciones.





CÓDIGOS DE RESPUESTA



VERSIONADO

BEST PRACTICES

Backward Compatibility
It is an excellent practice to have your API backward compatible if possible.

URI Versioning
While creating new versions of your API, you should add the version number in your API URI.

Use Semantic Versioning
You use semantic versioning to version your API, i.e., major.minor.patch. If you have introduced some major changes that would break the previous version, you should update the major version like 2.0.0. You update the minor one when you make some new changes, but they are not breaking the previous release. And lastly, if you are patching some bug, update the patch number.

EJEMPLOS

CREAR RECURSOS

```
POST /projects
Content-Type: application/json
Accept: application/json

{
    "name": "My cool project",
    "description": "Bla bla .."
}
```

```
HTTP/1.1 201 Created
Location: /projects/123
Content-Type: application/json

{
    "id" : 123,
    "name": "My cool project",
    "description": "Bla bla .."
}
```

RECUPERAR RECURSOS

```
GET /paintings
Accept: application/json
```

```
HTTP/1.1 200 (Ok)
Content-Type: application/json

[
    {
        "id": 1,
        "name": "Mona Lisa"
    }, {
        "id": 2
        "name": "The Starry Night"
    }
]
```

EJEMPLOS

MODIFICAR RECURSOS

```
PUT /products/345
Content-Type: application/json

{
    "name": "Cool Gadget",
    "description": "Looks cool",
    "price": "24.99 USD"
}
```

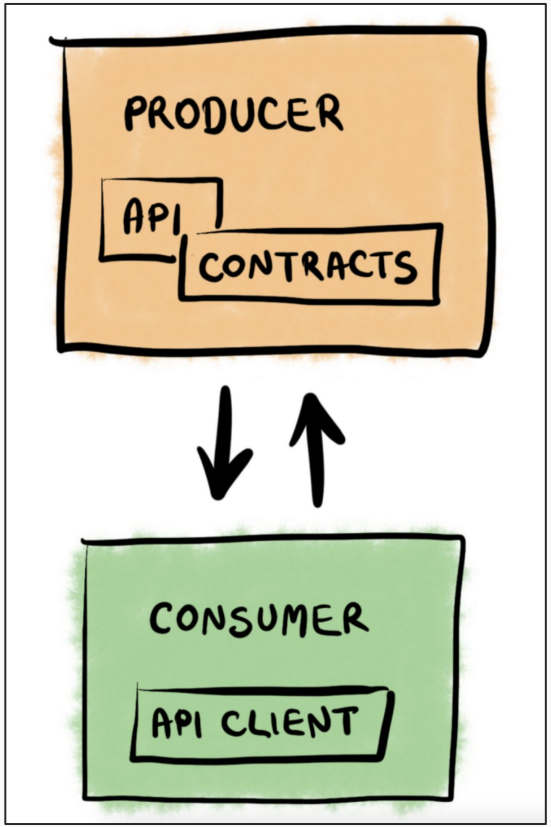
```
HTTP/1.1 204 (No content)
```

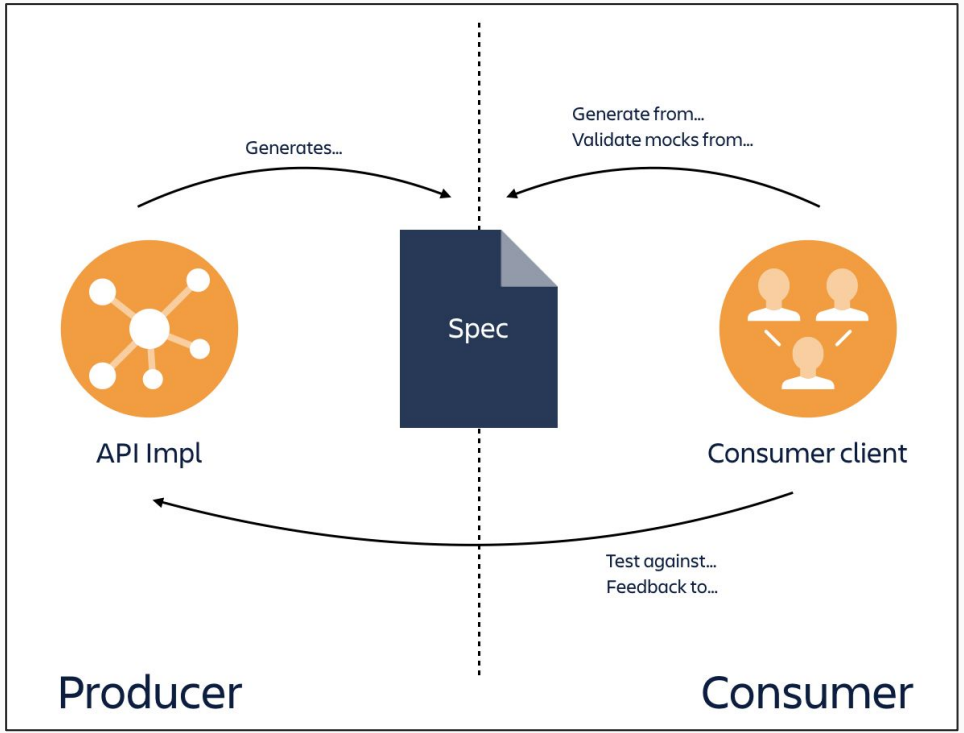
BORRAR RECURSOS

```
DELETE /artists/123
```

```
HTTP/1.1 204 (No content)
```

API CONTRACT / SPECIFICATION





OPENAPI SPECIFICATION

OpenAPI es un formato para describir web APIs, por lo tanto está totalmente ligado al protocolo HTTP.

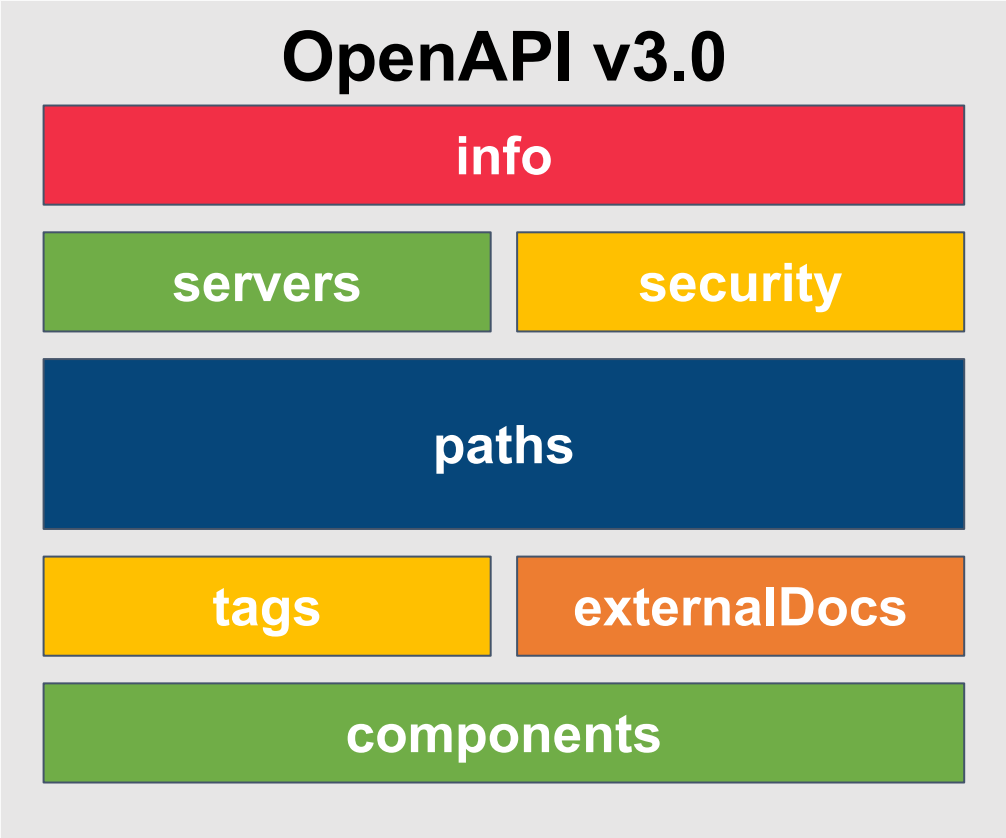
- Permite definir un contrato común y público entre servicios : proveedor - consumidor.
- ES Human and machine readable.
- Independiente del lenguaje/framework/tecnología.
- Permite usar los formatos YAML o JSON.

YAML

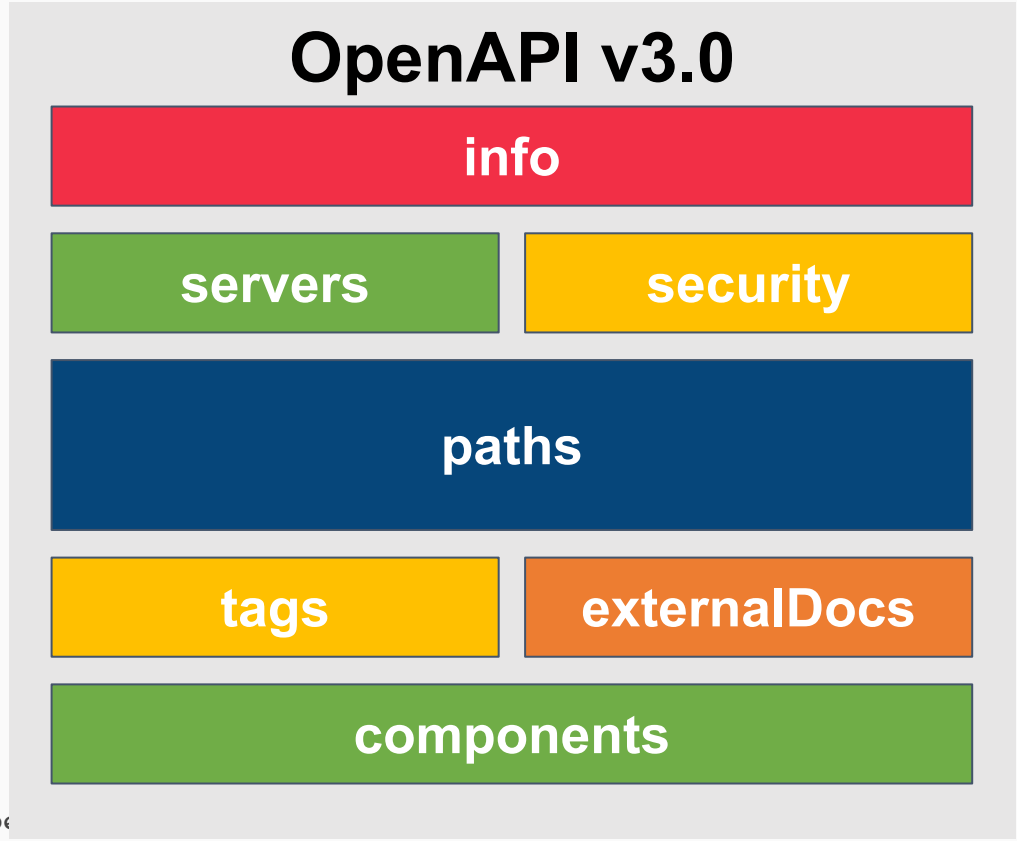
```yaml
openapi: 3.0.0
info:
  title: Sample API
  description: Multiline/single-line description in Common Mark or HTML.
  version: 0.1.9

servers:
  - url: http://api.example.com/v1
    description: Optional description, e.g. Main (production) server
  - url: http://staging-api.example.com
    description: Optional description, e.g. Internal staging server

paths:
  /users:
    get:
      summary: Returns a list of users.
      description: Optional extended description (Common Mark/HTML).
      responses:
        '200':    # status code
          description: A JSON array of user names
          content:
            application/json:
              schema:
                type: array
                items:
                  type: string
```

OPENAPI SPECIFICATION

- La sección **info** contiene información de alto nivel de la API como: Titulo descripción y versión.
- El objeto **servers** proporciona información de conectividad.
- El objeto **security** declara qué mecanismos de seguridad se pueden utilizar.
- El objeto **paths** describe los métodos a los que se puede acceder
- El objeto **components**, que contiene un conjunto de objetos/estructuras de datos reutilizables.
- **externalDocs**: Documentación externa adicional.



COMPONENTS




```yaml
openapi: 3.0.0
info:
  title: Swagger Petstore
paths:
  /pets/{petId}:
    get:
      summary: Info for a specific pet
      parameters:
        - name: petId
          in: path
          description: The id of the pet
          schema:
            type: string
      responses:
        200:
          content:
            application/json:
              schema:
                $ref: "#/components/schemas/Pet"
components:
  schemas:
    Pet:
      type: object
      properties:
        id:
          type: integer
          format: int64
        name:
          type: string
```

INFO

The `info` object contains information about the API you're documenting. This includes things like the `title`, `version` of the API, the API's `description`, links to its knowledge base (`documentation`), and its terms-of-service (`tos`).

According to the specification, this is what an `info` object should look like:

Name	Type	Description
`title`	`string`	*REQUIRED*. The title of the API.
`description`	`string`	A short description of the API. Markdown can be used here.
`termsOfService`	`string`	A URL to the Terms of Service for the API.
`contact`	Contact Object	The contact information for the exposed API.
`license`	License Object	The license information for the exposed API.
`version`	`string`	*REQUIRED*. The version of the documentation, not the OpenAPI spec.

```yaml
info:
  title: JSONPlaceholder
  description: Free fake API for testing and prototyping.
  version: 0.1.0
```

Copy

https://www.digitalocean.com/community/tutorials/how-to-create-documentation-for-your-rest-api-with-insomnia

EXTERNALDOCS AND SERVER

According to the specification, here's what the `externalDocs` object should look like:

Field Name	Type	Description
`description`	`string`	A short description of the target documentation. Markdown can be used.
`url`	`string`	*REQUIRED*. The URL for the target documentation.

In your YAML document, add an `externalDocs` object that points to JSONPlaceholder's guide:

```yaml
externalDocs:
  description: "JSONPlaceholder's guide"
  url: https://jsonplaceholder.typicode.com/guide
```

Copy

To fix this, OpenAPI provides a `servers` field. Add the following lines to your YAML document:

```yaml
servers:
- url: https://jsonplaceholder.typicode.com
  description: JSONPlaceholder
```

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PATH

According to the OpenAPI specification, this is what the `Path Item` object will look like:

Name	Type	Description
`summary`	`string`	An optional summary of this route.
`description`	`string`	An optional description of what the route can do.
`get` / `post` / `put` / `patch` / `delete` /etc	Operation Object	A definition of an operation (method) on this route.
`servers`	Array of Server Objects	An alternative `server` array to service all operations in this path.
`parameters`	An array of Parameter Object	Parameters that are applicable for all operations on this path. These parameters can be on the querystring, header, cookie, or the path itself.

```yaml
paths:
  "/posts":
    # ...
    <$>post<$>:
      tags: ["posts"]
      summary: Create a new post
      responses:
        "200":
          description: A post was created
          content:
            application/json:
              schema:
                $ref: "#/components/schemas/post"
```

Copy

https://www.digitalocean.com/community/tutorials/how-to-create-documentation-for-your-rest-api-with-insomnia

OPERATION

The `operation` object has many items, but for this tutorial, you'll focus on a smaller set:

Name	Type	Description
`tags`	Array of `string`s	A list of tags for API documentation control. Tags can be used for grouping similar routes.
`summary`	`string`	A short summary of what the operation does.
`description`	`string`	A description of the operation. Markdown can be used here.
`externalDocs`	External Documentation Object	Additional external documentation for this operation. Same as `externalDocs` on the main object.
`parameters`	Array of Parameter Objects	Same as `parameters` in the Path Item object.
`requestBody`	Request Body Object	The body of the request. This can NOT be used when the method `GET` or `DELETE`.
`responses`	Responses Object	*REQUIRED*. The list of possible responses returned by the API for this operation.

```yaml
paths:
  "/posts":
    # ...
    <$>post<$>:
      tags: ["posts"]
      summary: Create a new post
      responses:
        "200":
          description: A post was created
          content:
            application/json:
              schema:
                $ref: "#/components/schemas/post"
```

Copy

SCHEMA

```yaml
components:
  schemas:
    post:
      type: object
      properties:
        id:
          type: number
          description: ID of the post
        title:
          type: string
          description: Title of the post
        body:
          type: string
          description: Body of the post
        userId:
          type: number
          description: ID of the user who created the post
```

Copy

The above schema is an `object`, denoted by `type: object`. It has four `properties`: `id`, `title`, `body`, and `userId`. That is how a schema is defined. Now you can use `$ref` in any object to reference this schema. This is defined as per the specification for URI syntax, RFC3986.

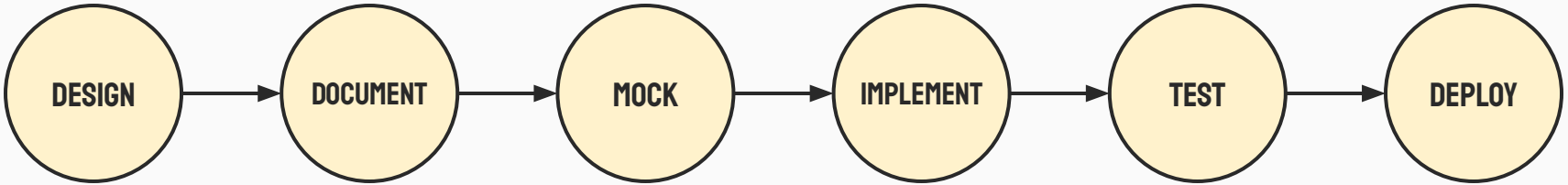
https://www.digitalocean.com/community/tutorials/how-to-create-documentation-for-your-rest-api-with-insomnia

EJEMPLO OPENAPI

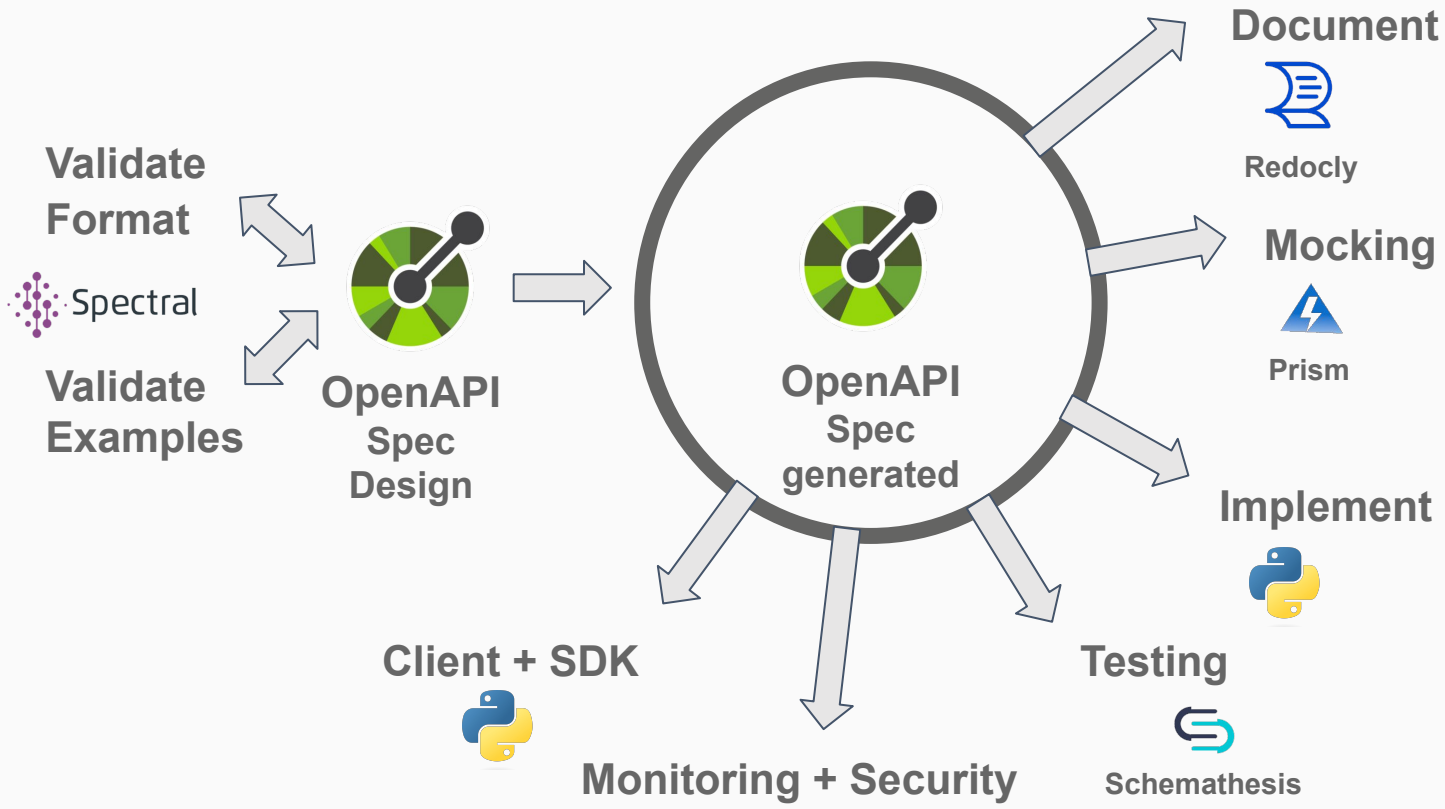
Ahora revisemos un par de ejemplos usando Insomnia y Postman como editores.

06.
CICLO DE VIDA

API LIFECYCLE



API LIFECYCLE



OPEN API TOOLS

https://openapi.tools/

Tool Types

- **Auto Generators:** Tools that will take your code and turn it into an OpenAPI Specification document.
- **Converters:** Various tools to convert to and from OpenAPI and other API description formats.
- **Data Validators:** Check to see if API requests and responses are lining up with the API description.
- **Description Validators:** Check your API description to see if it is valid OpenAPI.
- **Documentation:** Render API Description as HTML (or maybe a PDF) so slightly less technical people can figure out how to work with the API.
- **DSL:** Domain Specific Language to write OpenAPI in your language of choice.
- **GUI Editors:** Visual editors help you design APIs without needing to memorize the entire OpenAPI specification.
- **Miscellaneous:** Anything else that does stuff with OpenAPI but hasn't quite got enough to warrant its own category.
- **Mock Servers:** Fake servers that take description document as input, then route incoming HTTP requests to example responses.
- **Parsers:** Loads and read OpenAPI descriptions, so you can work with them programmatically.
- **SDK Generators:** Generate code to give to consumers, to help them avoid interacting at a HTTP level.
- **Security:** By poking around your OpenAPI description, some tools can look out for attack vectors you might not have noticed.
- **Server Implementations:** Easily create and implement resources and routes for your APIs.
- **Testing:** Quickly execute API requests and validate responses on the fly through command line or GUI interfaces.
- **Text Editors:** Text editors give you visual feedback whilst you write OpenAPI, so you can see what docs might look like.
- **Learning:** Whether you're trying to get documentation for a third party API based on traffic, or are trying to switch to design-first at an organization with no OpenAPI at all, learning can help you move your API spec forward and keep it up to date

API LIFECYCLE COMMANDS

Validar especificación:

```
$ spectral lint openapi.yaml
```

Generar Documentación:

```
$ redocly preview-docs openapi.yaml
```

Generar Mocks:

```
$ prism mock -d openapi.yaml # Dynamic examples
$ prism mock openapi.yaml # Static examples
```

Generar código:

```
$ openapi-generator-cli generate -g python-fastapi -o api_server -i openapi.yaml
$ openapi-python-client generate --path openapi.yaml
```

Pruebas:

```
$ st run openapi.yaml
```

RECURSOS.

RECURSOS

- Curso APIs for Beginners en freecodecamp.org por Craig Dennis.
  - https://www.freecodecamp.org/news/apis-for-beginners-full-course/
  - Github del Curso.
- Presentación del curso.
- Recursos Twilio
  - Docs Twilio
  - https://www.twilio.com/docs/sms/quickstart/python
- Postman: https://www.postman.com/
- Insomnia: https://insomnia.rest/
- CURL: https://curl.se/
- Ejemplo de crear una api con Insomnia:
  https://www.digitalocean.com/community/tutorials/how-to-create-documentation-for-your-rest-api-with-insomnia
- OpenAPI Specification: https://spec.openapis.org/oas/latest.html
- Rest API Design: https://www.mscharhag.com/p/rest-api-design
- Jose Haro Peralta - Documentation-driven development for Python web APIs
  https://www.youtube.com/watch?v=prGzBqUAXi4

THANKS

Does anyone have any questions?

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