Introduction to Python and APIs

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Big Data recap

1. What are the three main characteristics of Big Data?
2. Mention at least one example where Big Data is useful?
3. What are the main requirements for Big Data analysis?

Python I

- Strings
- List
- Array
- Dictionary
- File IO
- Function
- Objects
- Class

Introduction to Application Programming Interface (APIs) – Part I

Key Terms

- ***Server***: A powerful computer that runs an API
- ***API***: The "hidden" portion of a website that is meant for computer consumption
- ***Client***: A program that exchanges data with a server through an API
- ***Protocol***: An “extremely rigid” set of rules that govern how two computers can speak to each other.

“Extremely rigid”

a) "My favorite color is blue"
b) "Blue is my favorite color."

For humans (a) and (b) are the same while it is different for computers talking with a certain protocol.

Computer Protocols

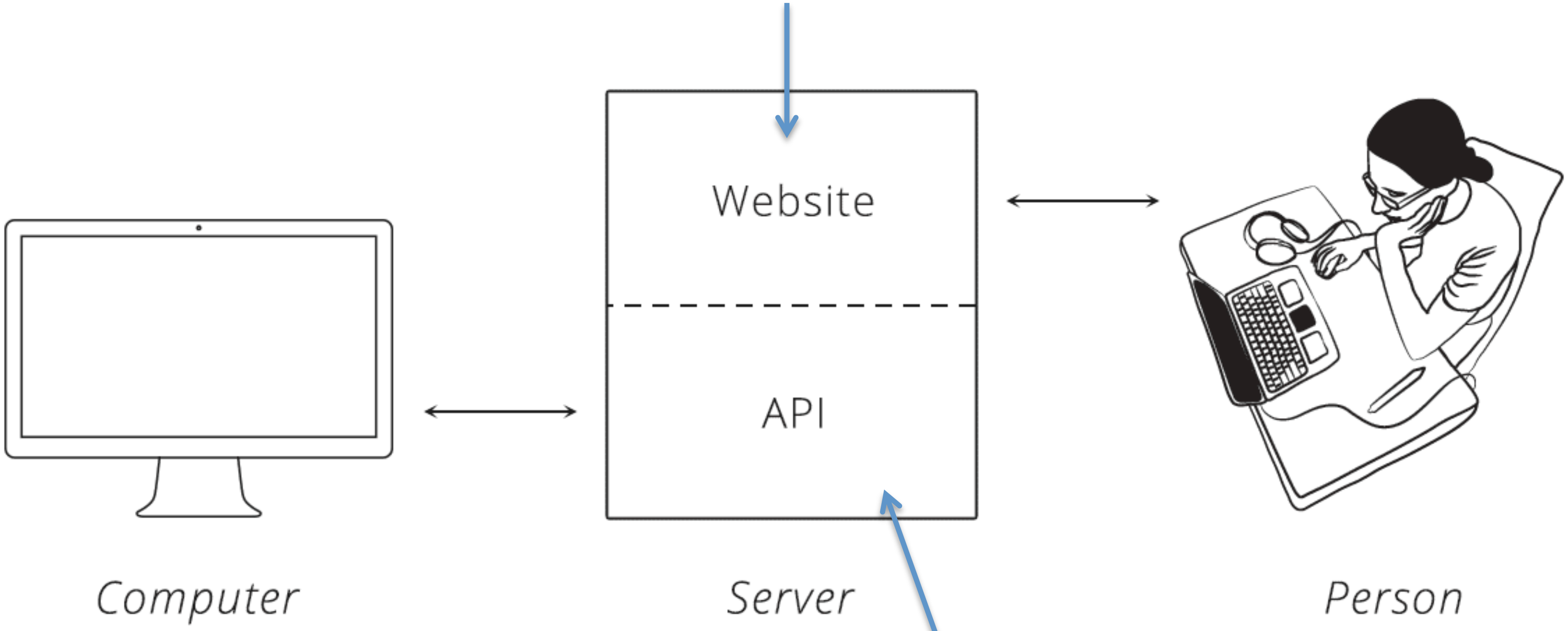
- Any communication between computers require a certain protocol.

- Bluetooth for connecting devices, POP or IMAP for fetching emails. The web main protocol is the Hyper-Text Transfer Protocol –HTTP.

- Most APIs use the HTTP protocol to communicate.

What is an API?

Optimal for humans but difficult for computers



Makes a website's data digestible for a computer

https://zapier.com/learn/apis/chapter-1-introduction-to-apis/

Data Exchange

- Once a client makes a successful communication through an API, the server returns a data in a certain format.
- The most common formats found in modern APIs are JSON (JavaScript Object Notation) and XML (Extensible Markup Language).

Data Formats

- Delimited values
  - Comma Separated Values (CSV)
  - Tab Separated Values (TSV)
- Markup languages
  - Hypertext Markup Language (HTML5 / XML)
  - JavaScript Object Notation (JSON) Hierarchical Data Format (HDF5)
- Ad hoc formats
  - Graph edge lists, voting records, fixed width files, ...

JSON

```
{
  "crust": "original",
  "toppings": ["cheese", "pepperoni", "garlic"],
  "status": "cooking",
  "customer": {
    "name": "Brian",
    "phone": "573-111-1111"
  }
}
```

XML

```xml
<order>
    <crust>original</crust>
    <toppings>
        <topping>cheese</topping>
        <topping>pepperoni</topping>
        <topping>garlic</topping>
    </toppings>
    <status>cooking</status>
</order>
```

Main references

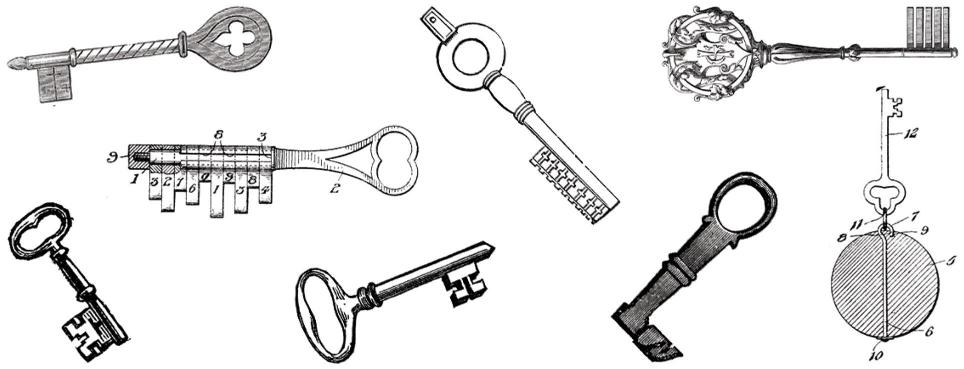
1. https://zapier.com/learn/apis/chapter-2-protocols/

End

Scikit-learn

- some-model-name.fit( )
- some-model-name.predict( )
- some-model-name.score( )

API Authentication



Authentication: process of the client proving its identity to the server
Credentials: secret pieces of info used to prove the client's identity (username, password...)
Basic Auth: scheme that uses an encoded username and password for credentials. Has full control.
API Key Auth: scheme that uses a unique key for credentials. Has limited control.

Open Authorization (Oauth)

What is an API good for?

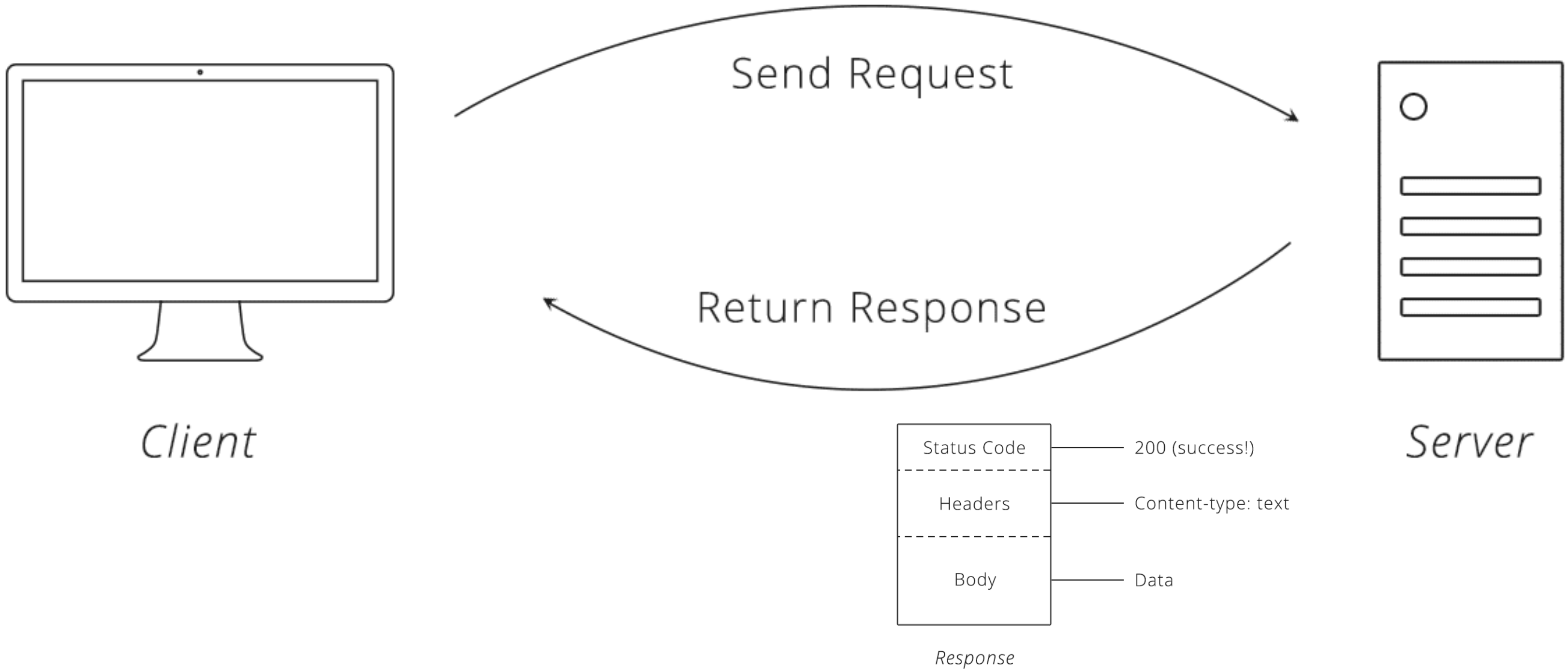
- Sync across different device e.g. laptop, mobile phone, tablet

HTTP “request” and “response”

Methods:
GET - Asks the server to retrieve a resource
POST - Asks the server to create a new resource
PUT - Asks the server to edit an existing resource
DELETE - Asks the server to delete a resource

URL	http://example.com
Method	POST
Headers	User-Agent...
Body	Data

Request



Status Code	200 (success!)
Headers	Content-type: text
Body	Data

Response

HTTP request: order pizza

You place an order by making a POST request to the restaurant's server with your order details, asking them to create your pizza. As soon as you send the request, however, you realize you picked the wrong style crust, so you make a PUT request to change it.

While waiting on your order, you make a bunch of GET requests to check the status. After an hour of waiting, you decide you've had enough and make a DELETE request to cancel your order.