Fetching data:

APIs & web scraping

- JSON format
- APIs
- Scraping web pages

- JSON is a lightweight data-interchange format
- JSON format passes data as a **string**
- Stands for (JavaScript Object Notation)

- JSON is language independent
- JSON is "self-describing" and easy to understand

- It would be just another format but has some useful properties

JSON – is all about **key : value** pairs

- In this example employees, firstName and lastName are the values

```
{"employees":[
    {"firstName":"John", "lastName":"Doe"},
    {"firstName":"Anna", "lastName":"Smith"},
    {"firstName":"Peter", "lastName":"Jones"}
]}
```

In this example John, Anna, Peter and Doe, Smith and Jones are **values**

API – Application Programming Interface

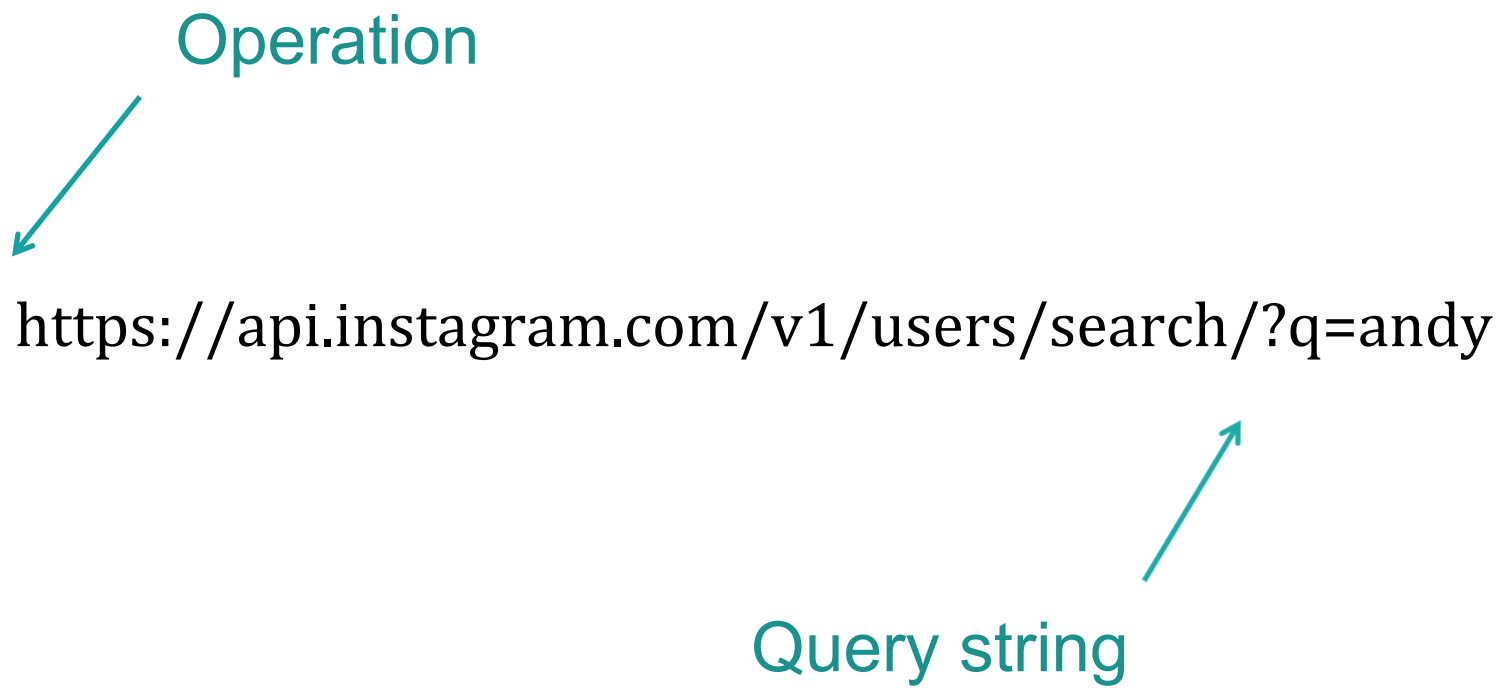
- APIs allow people to interact with the structures of an application to get, put, delete, or update data
- Data is often made available on the web via website APIs
- Best practices for APIs are to use RESTful principles

Restful APIs

RESTful APIs include:

- A Base URL and collection
- A media type (usually JSON)
- Operations (GET, PUT, POST, DELETE) using http requests

GET https://api.instagram.com/v1/users/10


Operation
GET https://api.instagram.com/v1/users/search/?q=andy
Query string

- Most APIs have language specific libraries to make the API easier to access through the language of your choice
  - Python libraries are typically among the ones available

- http://www.pythonapi.com/

- RESTful APIs can always be accessed using cURL or Postman requests

- Web scraping is:
  - Extracting information from websites (simulates a human copying and pasting)
  - Based on finding patterns in website code (usually HTML)
- What are best practices for web scraping?
  - Scraping too many pages too fast can get your IP address blocked
  - Pay attention to the robots exclusion standard (robots.txt)- Let's look at http://www.imdb.com/robots.txt

- HTML is interpreted by a web browser to produce ("render") a web page
  - Let's look at data/example.html
  - Tags are opened and closed
  - Tags have optional attributes
- How to view HTML code:
  - To view the entire page: "View Source" or "View Page Source" or "Show Page Source"
  - To view a specific part: "Inspect Element"
  - Safari users: Safari menu, Preferences, Advanced, Show Develop menu in menu bar