

# **DATA SCIENCE**

## **APIS**

**I. HOW DO I GET DATA FROM THE INTERNET?**

**II. WHAT'S AN API?**

**III. RESTFUL WEB SERVICES**

**IV. APIS: WITH AND WITHOUT WRAPPERS**

**V. WHAT APIS ARE AVAILABLE?**

# **I. HOW DO I GET DATA FROM THE INTERNET?**

- Files – easy but restrictive data access
- Web scraping – difficult but unrestricted data access
- APIs – easy to use but less restricted data access – just right!

# **II. WHAT'S AN API?**

- API – Application Programming Interface
- APIs expose functionality and data access to users
- Basic functionality of APIs – CRUD
  - Create
  - Read
  - Update
  - Delete

- Allow for internal and third party development
- Examples
  - Instagram
  - Twitter
  - Facebook
  - Data Science Toolkit

# **III. RESTFUL WEB SERVICES**



- RESTful APIs provide an interface to web services
- Governed by “RESTful” principles
- Data and functionality are considered resources
- Accessed via **Uniform Resource Identifiers (URIs)** AKA endpoints
- URIs are often web URLs
- Sent with headers — specify extra information like type of data or credentials
- Several actions: PUT, GET, POST, DELETE

- PUT creates something new
- GET retrieves data that already exists
- POST transfers a new state (often used to update information)
- DELETE deletes
- Response is typically JSON
  - Status Code: 200 is OK; 4XX there is an error
  - Body: Any information that is returned from the API

- How to use a RESTful API

1. Make a request/call to an endpoint (URI). This request has headers to give meta information and can have a body that tells the endpoint what you want to do.
2. Receive a response, typically JSON encoded
3. Response has two parts
  1. Status Code: 200 is OK; 4XX there is an error
  2. Body: Any information that is returned from the API

- Examples
- Fake API endpoint at “[www.brandonmburroughs.com/addition](http://www.brandonmburroughs.com/addition)”
  - Request: Send this API some numbers
  - Response: It will send you back their sum
- Twitter Search
  - Request: Send Twitter a hashtag “#gagradnight”
  - Response: Get back all of the tweets with that hashtag

# **IV. APIS: WITH AND WITHOUT WRAPPERS**

- Wrapper – Functionality (code), in your chosen language, that handles all of inner workings of the API request
- An API with a wrapper looks like a normal Python function
- An API without a wrapper means you need to use other Python libraries to create and send a request to the endpoint

# **V. WHAT APIS ARE AVAILABLE?**

- A lot!
- Most websites that have data expose APIs
- Read the documentation
- <http://www.pythonforbeginners.com/api/list-of-python-apis>
- Mashape: <https://www.mashape.com/explore>
- Apigee: <https://apigee.com/providers>
- Data Science Toolkit
- `pip install dstk --allow-unverified dstk`