Introduction to APIs and JSON

go.ncsu.edu/introapis

Outline

- Intro to APIs
- Intro to JSON
- Exercise: Explore an API

Intro to APIs

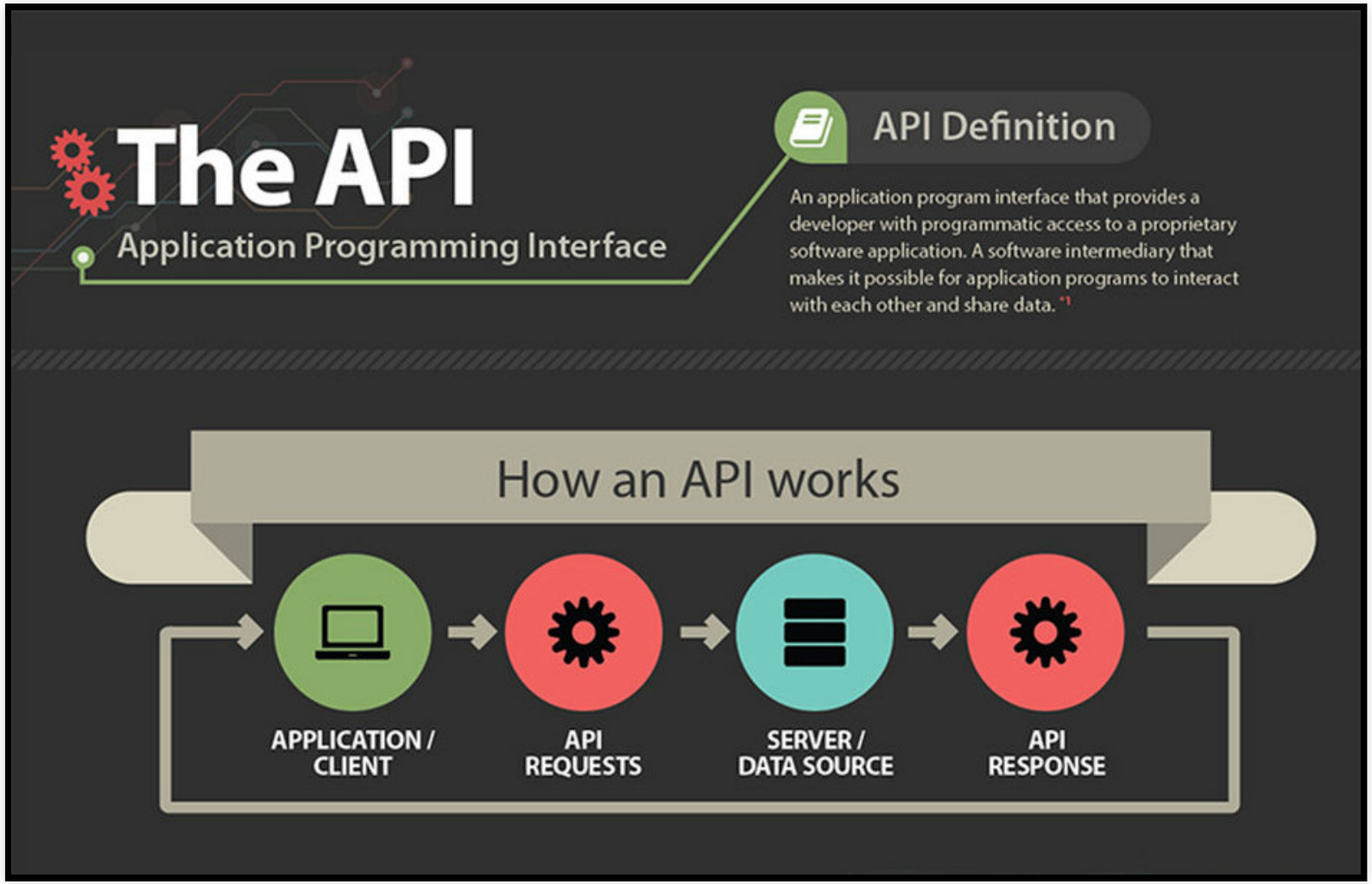
What is an API?

- Application Programming Interface
- Building blocks for developing a computer program
- Web-based system, operating system, software library, etc
- Specifications for routines, data structures, variables, etc

Web APIs

When used in the context of web development, an API is typically a defined set of specifications, such as Hypertext Transfer Protocol (HTTP) request messages, along with a definition of the structure of response messages, which is usually in an Extensible Markup Language (XML) or JavaScript Object Notation (JSON) format.

Wikipedia



Retrieved from What's an API and Why Do You Need One?

Examples of Web APIs

- Twitter APIs
- Data.gov APIs
- The Star Wars API (SWAPI)

API Help(ers)!

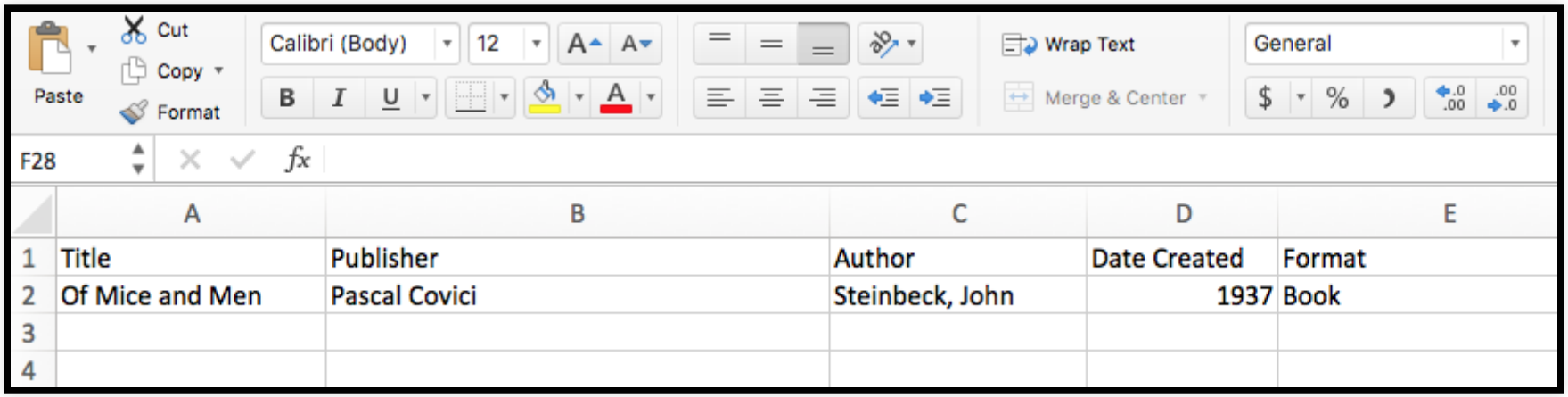
- Twitter API Libraries
  - TwitteR
- Using Data.gov APIs in R
- SWAPI Helper libraries

Intro to JSON

JSON Basics

- JavaScript Object Notation is a data format
- Based on a subset of the JavaScript Programming Language
- Text based and language independent

Simple JSON Example



	A	B	C	D	E
1	Title	Publisher	Author	Date Created	Format
2	Of Mice and Men	Pascal Covici	Steinbeck, John	1937	Book
3					
4					

```
{
"Title": "Of Mice and Men",
"Publisher": "Pascal Covici",
"Author": "Steinbeck, John",
"DateCreated": "1937",
"Format": "Book"
}
```

JSON Data Types

- Strings: `"name": "Jacob"`
- Numbers: `"age": 30`
- Objects: `"employee": {`

  `"name":"Jacob","age":30}`
- Arrays: `"employees": ["Jacob", "Walt"]`
- Booleans: `"librarian": true`

More on JSON Data Types

Complex JSON Example

```
{
  "paintings": [
    {
      "name": "The Scream",
      "url": "https://en.wikipedia.org/wiki/The_Scream",
      "creator": {
        "@type": "Person",
        "name": "Edvard Munch",
        "sameAs": "https://en.wikipedia.org/wiki/Edvard_Munch"
      }
    },
    {
      "name": "Melancholy",
      "url": "https://en.wikipedia.org/wiki/Melancholy_(Edvard_Mu
      "creator": {
        "@type": "Person"
```

JSON Help!

- JSONLint
- [Microsoft Excel] Connect to a JSON File
- Your JSON data is ready for analysis in Tableau 10.1!

Exercise!

Scavenger Hunt: Explore SWAPI

Using your weapon of choice (web browser, Python, R, etc), explore SWAPI and answer these questions:

1. Which movies did George Lucas produce?
2. When was The Force Awakens released?
3. According to the API, which planets were featured in The Empire Strikes Back?
    - Which of these planets has the highest pop?

swapi.co

Questions?

Thank you!

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