

INLS 672

Web Development 2

JavaScript and Third-Party APIs



UNC
SCHOOL OF INFORMATION
AND LIBRARY SCIENCE

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Part 1: Overview

Part 2: Examples

Third-Party APIs

- Many large websites and services provide access to their data through APIs that reside on their servers.
- Social media, news media, and government agencies are typical examples of organizations that provide APIs to their data
- This approach differs from simply fetching a JSON data file from an open data source. With third-party APIs, the data-owning organization specifies an interface for making requests; these requests are processed by server-side applications that return a response in a standard format

General approach for using third-party APIs

- Find the documentation, and study the examples
- Get a developer (or API) key
- Connect the API to your app
- Request data using the API
- Display the data

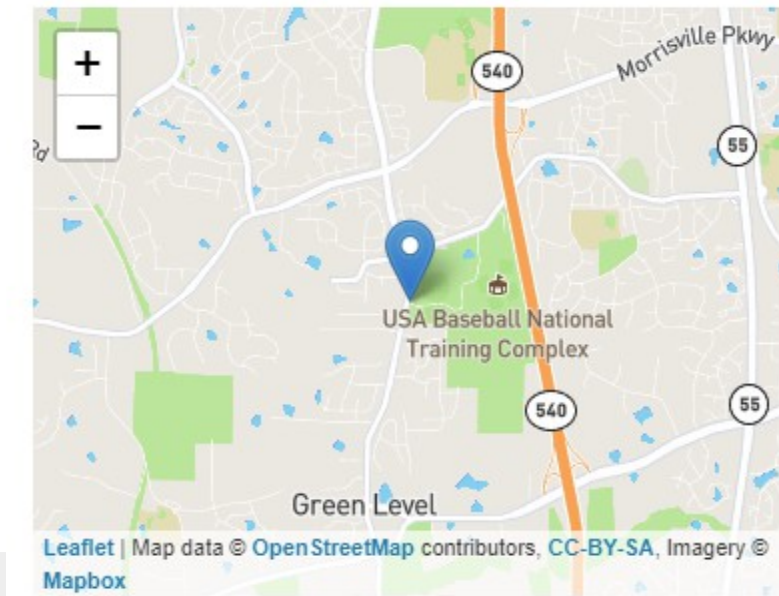
Example: Leaflet Map API

HTML: Add links to Leaflet style sheet and JavaScript Library

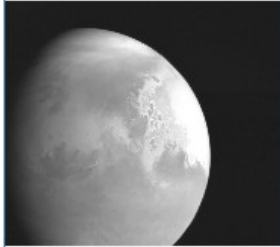
```
<link rel="stylesheet"
      href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css" ... />
<script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js" ... </script>
```

JavaScript: Add code to call Leaflet API to display a map centered on a latitude and longitude

```
var mymap = L.map('map').setView([lat, lon], 13);
mymap.setView([lat, lon], 13);
L.tileLayer('https://api.mapbox.com/styles/...?access_token=...',
  { maxZoom: 18,
    id: 'mapbox/streets-v11',
    tileSize: 512,
    zoomOffset: -1,
    accessToken: 'your.mapbox.access.token'
  } ).addTo(mymap);
L.marker([lat, lon]).addTo(mymap);
```



China's Mars Mission Begins Orbit of the Red Planet



By Michael Roston

The Tianwen-1 mission is the second of three new visitors to Mars this month.

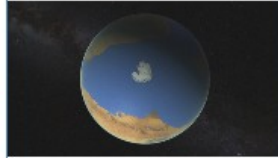
Mars Mission From the U.A.E. Begins Orbit of Red Planet



By Kenneth Chang

The Hope spacecraft fired its engines on Tuesday and was grappled by the planet's gravity to begin its atmospheric science studies.

The Water on Mars Vanished. This Might Be Where It Went.



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Mars once had rivers, lakes and seas. Although the planet is now desert dry, scientists say most of the water is still there, just locked up in rocks.

Get Ready for the First Flight of NASA's Mars Helicopter



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The experimental vehicle named Ingenuity traveled to the red planet with the Perseverance rover, which is also preparing for its main science mission.

New York Times Article Search API

<https://api.nytimes.com/svc/search/v2/articlesearch.json?q=mars&api-key=my-api-key>

Baked Fried Chicken With Cauliflower Mash



Cuisines: Southern

Diets:

Dish Types: lunch, main course, main dish, dinner

Roasted Lemon Pepper Pork Tenderloin with Cornbread Stuffing



Cuisines: Southern

Diets:

Dish Types: lunch, main course, main dish, dinner

Peanut Butter And Chocolate Oatmeal



Cuisines: Southern

Diets: gluten free, lacto ovo vegetarian

Dish Types: morning meal, brunch, breakfast

Auntie Naynay's Spicy Greens



Cuisines: Southern

Diets: gluten free, dairy free

Dish Types: side dish

Spoonacular Recipe Search API

<https://api.spoonacular.com/recipes/complexSearch?cuisine=southern&addRecipeInformation=true&apiKey=my-api-key>

Why use Third-Party APIs?

Socrata

The Socrata Open Data API allows you to programmatically access a wealth of open data resources from governments, non-profits, and NGOs around the world.

Twitter

Use it to analyze, learn from, and interact with Tweets, Direct Messages, users, and other key Twitter resources

US Patent Office

Makes it easier for innovators to further mine this data, helping to inform our customers where to spend their limited research and development resources, and providing a much more detailed view of the competitive landscape than previously available.

New York Times

To facilitate a wide range of uses, from custom link lists to complex visualizations. When you build applications, create mashups and otherwise reveal the potential of our data, we learn more about what our readers want and gain insight into how news and information can be reimagined.

Some Third-Party APIs

- [New York Times Developer Network](#)
- [Spoonacular](#)
- [TheMealDB](#)
- [NASA APIs](#)
- [Spotify for Developers](#)
- [Apple Music API](#)
- [OpenWeather API](#)
- [Twitter Developer](#)
- [Socrata Open Data API](#)
- [A collective list of APIs](#)
- [Top 8 Free Music APIs](#)
- [11 Popular Cities APIs](#)

Part 1: Overview

Part 2: Examples

Using the NYT API

- Go to [The New York Times Developer Network](#)
- Follow the steps at [Get Started](#) : create an account, get an API key, register your apps, and enable the use of the various APIs
- Decide which [APIs](#) you want to use. Read the documentation and study the examples.
- The NYT API is a [RESTful API](#) – instead of making a function call to a JavaScript library (as with Leaflet API), we get data by making HTTP requests to specific URLs that define the type of request.
 - These URLs are sometimes called endpoints – they define the path to the application that will satisfy the request. The URL below returns the current bestselling books in the Science category
<https://api.nytimes.com/svc/books/v3/lists/current/science.json>
 - Query parameters can be added to refine the request. The URL below searches for articles containing the keyword 'mars'
<https://api.nytimes.com/svc/search/v2/articlesearch.json?q=mars>

Example: NYT Article Search

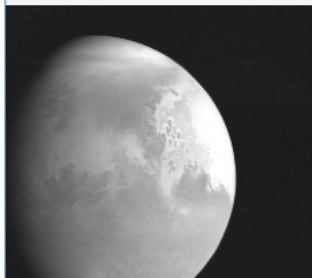
NASA Will Listen for Thumps From Its Rover's Arrival on Mars



By Kenneth Chang

Parts of the new visitor will make large impacts that could be picked up by the InSight spacecraft's seismometer.

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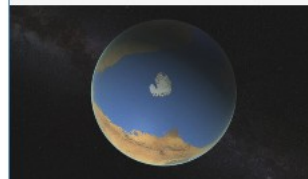
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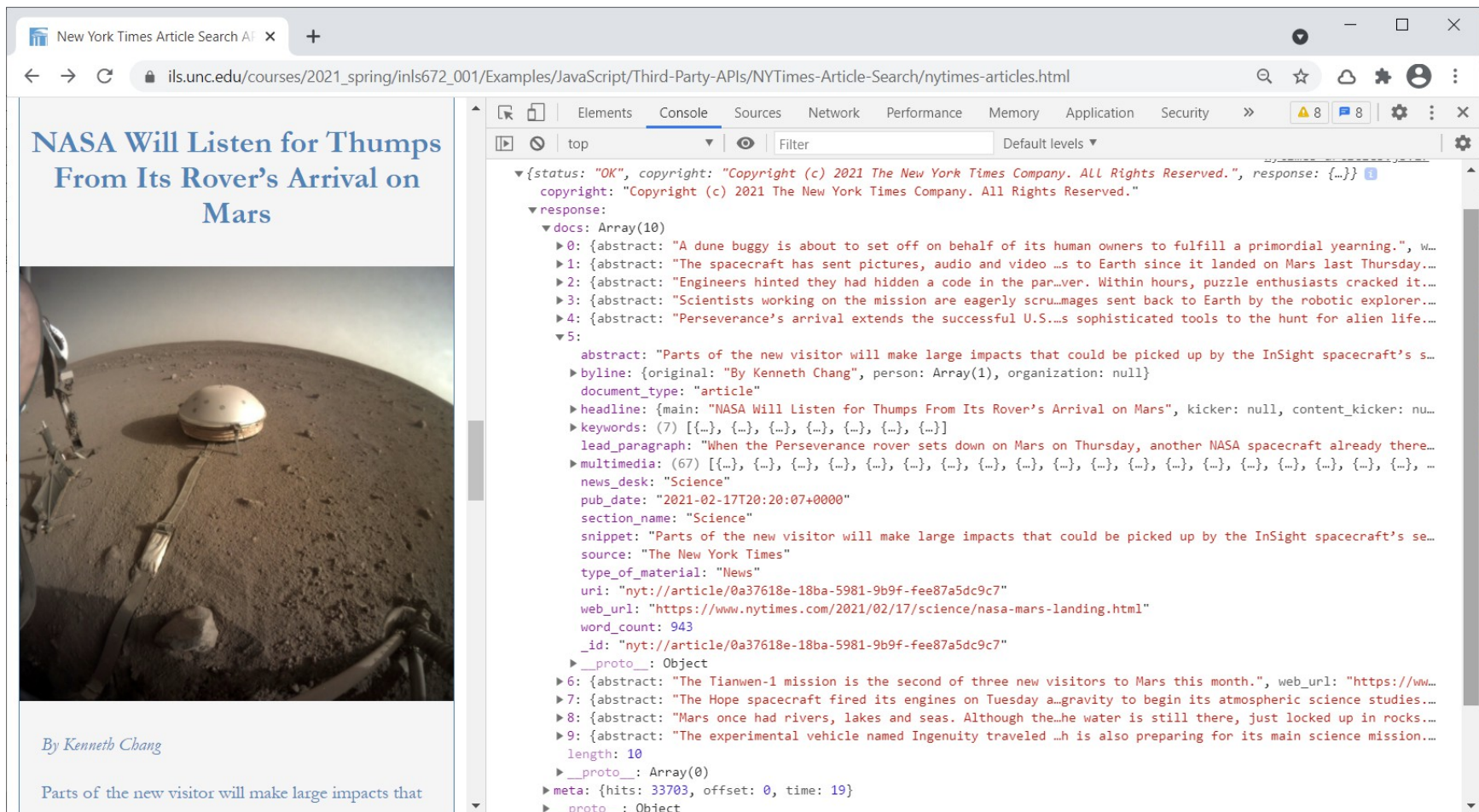
The experimental vehicle named Ingenuity traveled to the red planet with the Perseverance rover, which is also preparing for its main science mission.

NYT API to search current articles with the keyword 'mars'

<https://api.nytimes.com/svc/search/v2/articlesearch.json?>

[q=mars&api-key=my-api-key](https://api.nytimes.com/svc/search/v2/articlesearch.json?q=mars&api-key=my-api-key)

Example: NYT Article Search



The screenshot shows a web browser window with the URL `ils.unc.edu/courses/2021_spring/inls672_001/Examples/JavaScript/Third-Party-APIs/NYTimes-Article-Search/nytimes-articles.html`. The page displays a news article titled "NASA Will Listen for Thumps From Its Rover's Arrival on Mars" by Kenneth Chang. The article includes a photograph of the Mars rover's landing site. The browser's developer console is open, showing the JSON response from the API. The response is a nested object with a `status` of "OK", a `copyright` notice, and a `response` object containing an array of 10 document objects. The first document object is expanded, showing fields such as `abstract`, `headline`, `keywords`, `lead_paragraph`, `multimedia`, `pub_date`, `section_name`, `snippet`, `source`, `type_of_material`, `uri`, `web_url`, `word_count`, and `_id`.

- To view the JSON returned by this API call, open the Inspector, click the Console tab, and expand the contents.
- This was generated by the `console.log(obj)` statement in the JavaScript

Example: NYT Article Search

- Parse the JSON data by first setting up the reference to the array of articles:
`obj.response.docs`
- Loop through the array, extract data of interest (image, headline, byline, abstract, link to NYT article), and insert into the HTML template string

```
function getArticles() {
  let articleList = '';
  obj.response.docs.forEach(article => {
    let imageName = '';
    if(article.multimedia.length > 0) {
      imageName = 'http://www.nytimes.com/' + article.multimedia[0].url;
    }
    let articleData = `<article>
      <a href="${article.web_url}" alt="${article.headline.main}">
      <h2>${article.headline.main}</h2>
      <div class="card-content">
        
        <div class="card-description">
          <p class="byline">${article.byline.original}</p>
          <p>${article.abstract}</p>
        </div>
      </div>
    </a>
  </article>`;
    articleList += articleData;
  });
}
```

Using the Spoonacular Food API

- Go to the [Spoonacular](#) website, and select Start Now to set up an account and receive an API key
- Go to the Documentation section to learn about the available API functions
- Like the NYT API, the Spoonacular API is a RESTful API. It defines various endpoints to search and get recipe information. Query parameters are added to the endpoints to refine requests.
- For example,
- Search for Southern cuisine recipes
<https://api.spoonacular.com/recipes/complexSearch?cuisine=southern>
- Recipe information for Southern Fried Catfish (id=660697)
<https://api.spoonacular.com/recipes/660697/information>

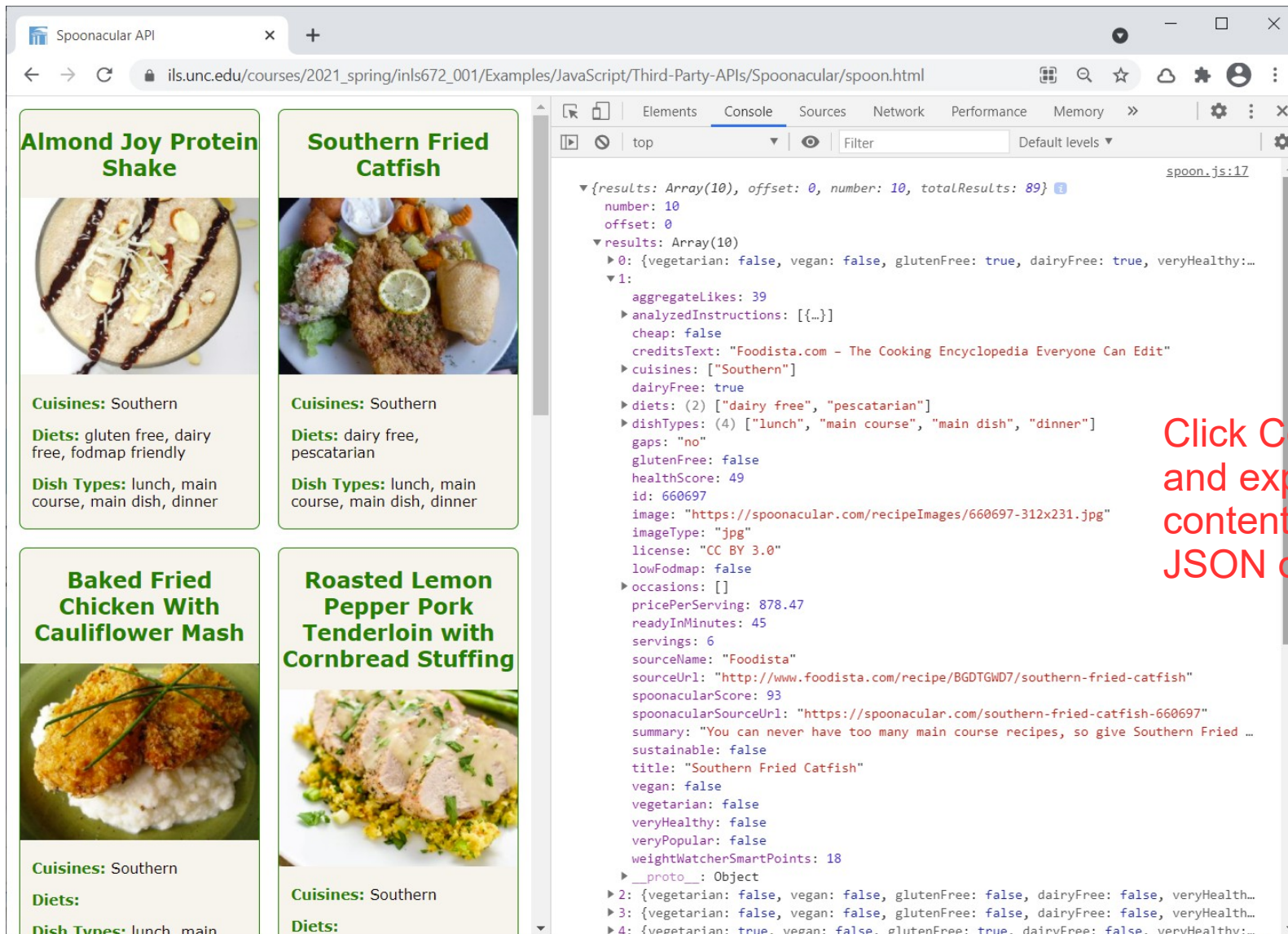
Example: Spoonacular Recipe Search

| | | | | |
|--|--|--|--|---|
| <p>Almond Joy Protein Shake</p>  <p>Cuisines: Southern</p> <p>Diets: gluten free, dairy free, fodmap friendly</p> <p>Dish Types: lunch, main course, main dish, dinner</p> | <p>Southern Fried Catfish</p>  <p>Cuisines: Southern</p> <p>Diets: dairy free, pescatarian</p> <p>Dish Types: lunch, main course, main dish, dinner</p> | <p>Baked Fried Chicken With Cauliflower Mash</p>  <p>Cuisines: Southern</p> <p>Diets:</p> <p>Dish Types: lunch, main course, main dish, dinner</p> | <p>Roasted Lemon Pepper Pork Tenderloin with Cornbread Stuffing</p>  <p>Cuisines: Southern</p> <p>Diets:</p> <p>Dish Types: lunch, main course, main dish, dinner</p> | <p>Peanut Butter And Chocolate Oatmeal</p>  <p>Cuisines: Southern</p> <p>Diets: gluten free, lacto ovo vegetarian</p> <p>Dish Types: morning meal, brunch, breakfast</p> |
|--|--|--|--|---|

Spoonacular API to search to search for southern recipe information

[https://api.spoonacular.com/recipes/complexSearch?
cuisine=southern&
addRecipeInformation=true&
apiKey=my-api-key](https://api.spoonacular.com/recipes/complexSearch?cuisine=southern&addRecipeInformation=true&apiKey=my-api-key)

Example: Spoonacular Recipe Search



The screenshot shows a web browser with the URL `ils.unc.edu/courses/2021_spring/inls672_001/Examples/JavaScript/Third-Party-APIs/Spoonacular/spoon.html`. The page displays four recipe cards, each with an image, title, cuisines, diets, and dish types. The browser's developer console is open, showing the JSON response for the search. The console output is as follows:

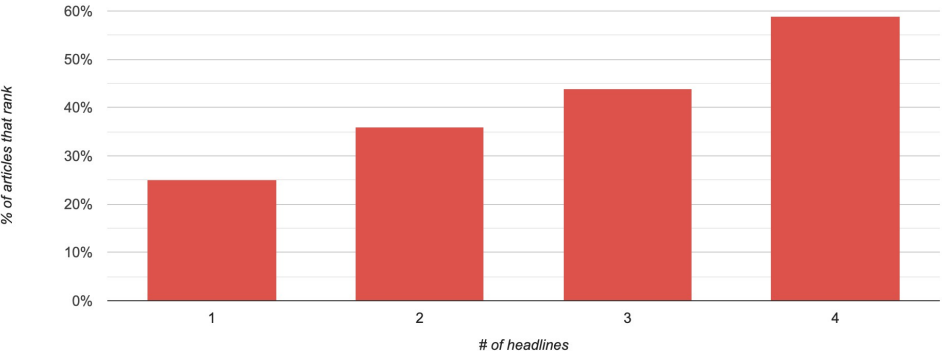
```
▼ {results: Array(10), offset: 0, number: 10, totalResults: 89}
  number: 10
  offset: 0
  results: Array(10)
    ▶ 0: {vegetarian: false, vegan: false, glutenFree: true, dairyFree: true, veryHealthy:...}
      ▼ 1:
        aggregateLikes: 39
        analyzedInstructions: [{...}]
        cheap: false
        creditsText: "Foodista.com - The Cooking Encyclopedia Everyone Can Edit"
        cuisines: ["Southern"]
        dairyFree: true
        diets: (2) ["dairy free", "pescatarian"]
        dishTypes: (4) ["lunch", "main course", "main dish", "dinner"]
        gaps: "no"
        glutenFree: false
        healthScore: 49
        id: 660697
        image: "https://spoonacular.com/recipeImages/660697-312x231.jpg"
        imageType: "jpg"
        license: "CC BY 3.0"
        lowFodmap: false
        occasions: []
        pricePerServing: 878.47
        readyInMinutes: 45
        servings: 6
        sourceName: "Foodista"
        sourceUrl: "http://www.foodista.com/recipe/BGDTGWD7/southern-fried-catfish"
        spoonacularScore: 93
        spoonacularSourceUrl: "https://spoonacular.com/southern-fried-catfish-660697"
        summary: "You can never have too many main course recipes, so give Southern Fried ..."
        sustainable: false
        title: "Southern Fried Catfish"
        vegan: false
        vegetarian: false
        veryHealthy: false
        veryPopular: false
        weightWatcherSmartPoints: 18
        __proto__: Object
      ▶ 2: {vegetarian: false, vegan: false, glutenFree: false, dairyFree: false, veryHealth...}
      ▶ 3: {vegetarian: false, vegan: false, glutenFree: false, dairyFree: false, veryHealth...}
      ▶ 4: {vegetarian: true, vegan: false, glutenFree: true, dairyFree: false, veryHealthy:...
```

Click Console tab and expand the contents to view JSON data

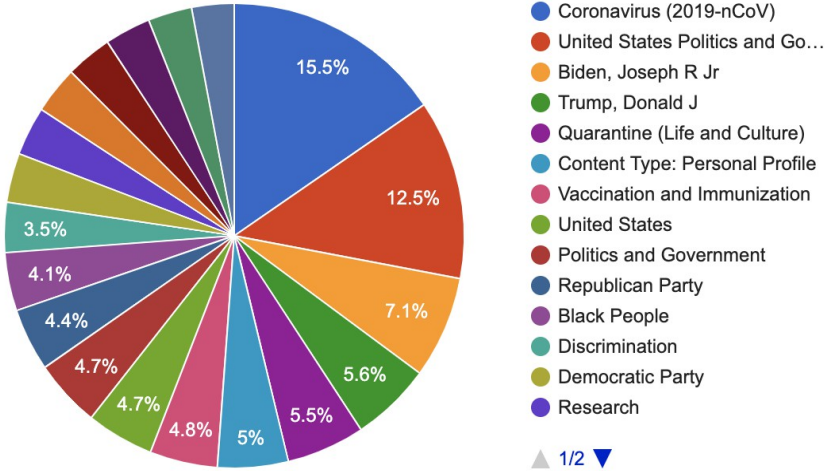
Interesting Use Cases: NYT API + Data Viz

TJCX blog: [How the New York Times A/B tests their headlines](#)

- NYT runs A/B tests on its headlines and uses those that attract more readers
- How many articles are A/B tested? How many headlines are tested for each article?



TJCX blog: [Tracking the front page of the New York Times](#)



- How much total front-page time is allotted to articles of a given type?
- The top 5 tags are either about US politics or COVID