

# INLS 672

## Web Development 2

# APIs and Data Visualization



UNC  
SCHOOL OF INFORMATION  
AND LIBRARY SCIENCE

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Part 1: Overview and Chart.js

Part 2: Examples

Part 3: And two more examples

# Data Visualization: What and Why?

UNC University Libraries:

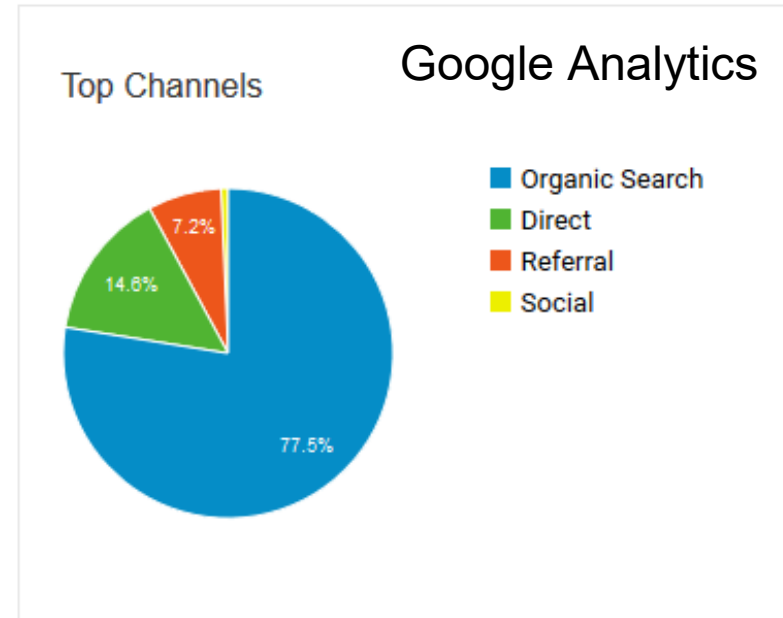
## Guide to Data Visualization: Basics

- Way of exploring complex patterns or large quantities of data to communicate information more clearly using visual patterns
- May be exploratory or communicative. They can more effectively answer questions, tell stories and put forth arguments than words alone

A List Apart:

## Big Data Visualization with Meaning

- Telling a story: The key to designing visualizations is to focus on something in the data that is relatable and resonates with your users
- Small multiples technique: Simultaneously display different aspects of the same data that represent different perspectives
- Visualizations can help users find insights, and meaningful information that is presented simply



	Acquisition		
	Users	New Users	Sessions
	1,697	1,466	2,491
1 Organic Search	1,331	<div style="width: 91.3%;"></div>	
2 Direct	250	<div style="width: 14.8%;"></div>	
3 Referral	124	<div style="width: 7.3%;"></div>	
4 Social	12	<div style="width: 0.7%;"></div>	

# Tools for Data Visualization

Many chart libraries

- [Datavisualization.ch](#) - collection of tools for maps, charts, and data
- [Data Visualisation Catalogue](#) - another library of viz tools

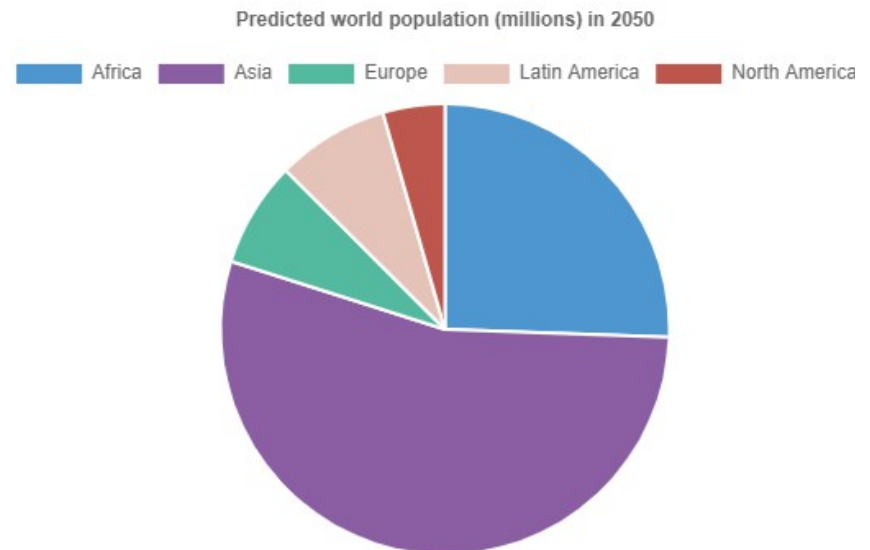
Many programming languages for data visualization

- [Top programming languages for Data Science in 2020](#)  
(Python, JavaScript, Java, R,... )
- UNC Guide to Data Visualization: [Programming](#)  
(R, JavaScript, Python)

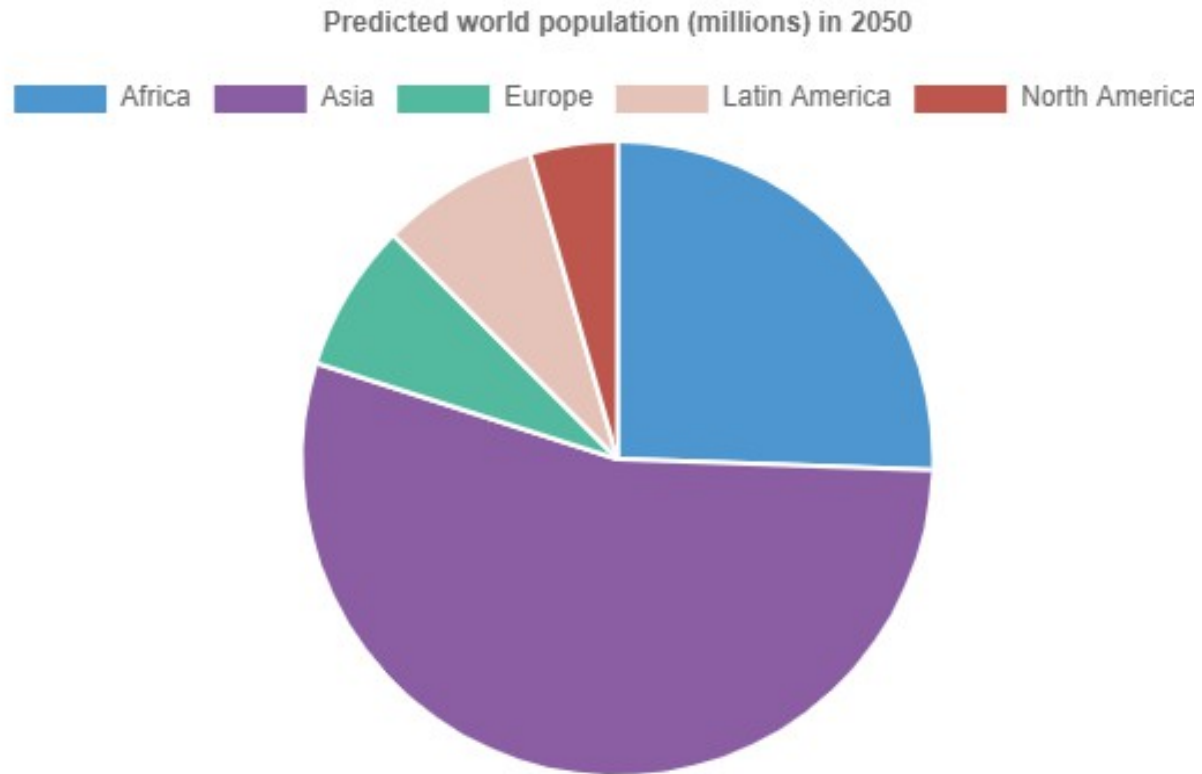
For design inspiration: [information is beautiful](#)

# Data Visualization with Chart.js

- Easy way to visualize data on your website
- Many types of charts: [Samples](#)
- Basic steps
  - Add Chart.js library to your web page using `<script>`
  - Define an area in your HTML to draw the chart using a `<canvas>` element
  - Prepare your data
  - Draw the chart



# Chart.js Pie Chart



Example: [pie-chart.html](#)

Tobias Ahlin Blog: [Documentation for example](#)

Chart.js [documentation for Doughnut and Pie Charts](#)

# Basic Pie Chart

Chart.js  
JavaScript libraries

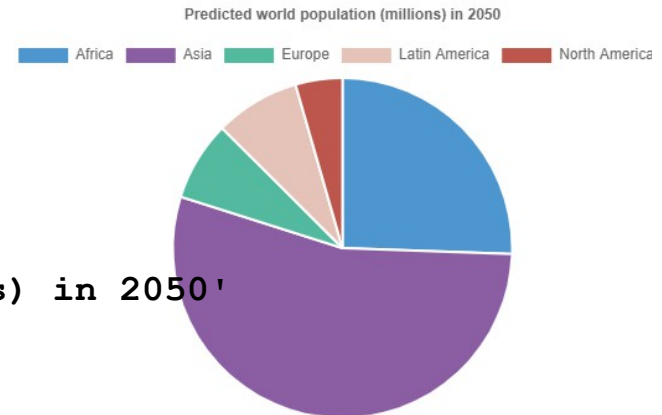
```
<head>
  <title>Bar Chart - World Population</title>
  <script src="https://cdnjs.cloudflare.com/ajax/libs/Chart.js/3.0.2/chart.min.js">
  </script>
</head>

<body>
  <canvas id="pie-chart"></canvas>
<script>
  new Chart(document.querySelector("#pie-chart"), {
    type: 'pie',
    data: {
      labels: ["Africa", "Asia", "Europe", "Latin America", "North America"],
      datasets: [{
        label: "Population (millions)",
        backgroundColor: ["#3e95cd", "#8e5ea2", "#3cba9f", "#e8c3b9", "#c45850"],
        data: [2478, 5267, 734, 784, 433]
      }]
    },
    options: {
      plugins: {
        title: {
          display: true,
          text: 'Predicted world population (millions) in 2050'
        }
      }
    }
  });
</script>
```

← Where the chart is drawn

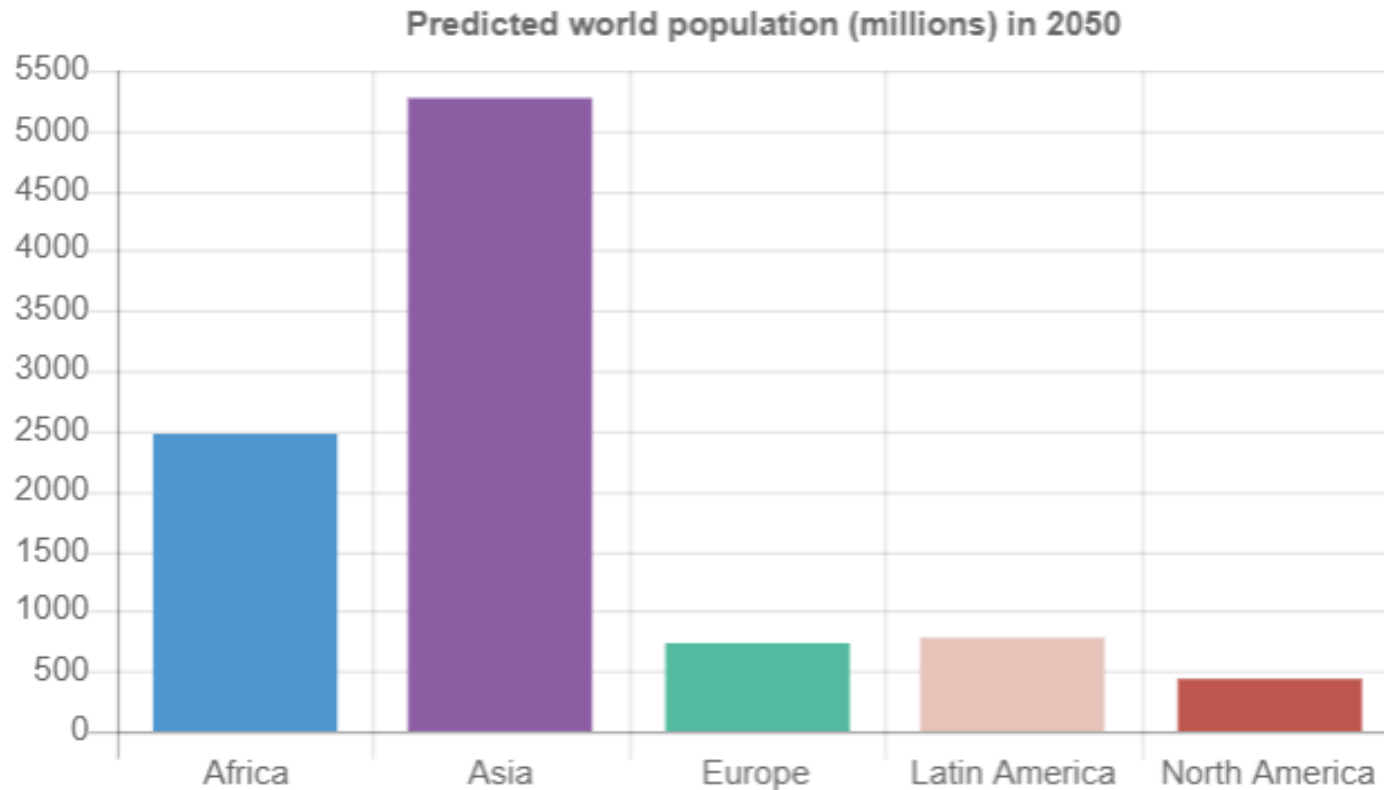
← Create the chart

← Customization options



pie-chart.html

# Chart.js Bar Chart



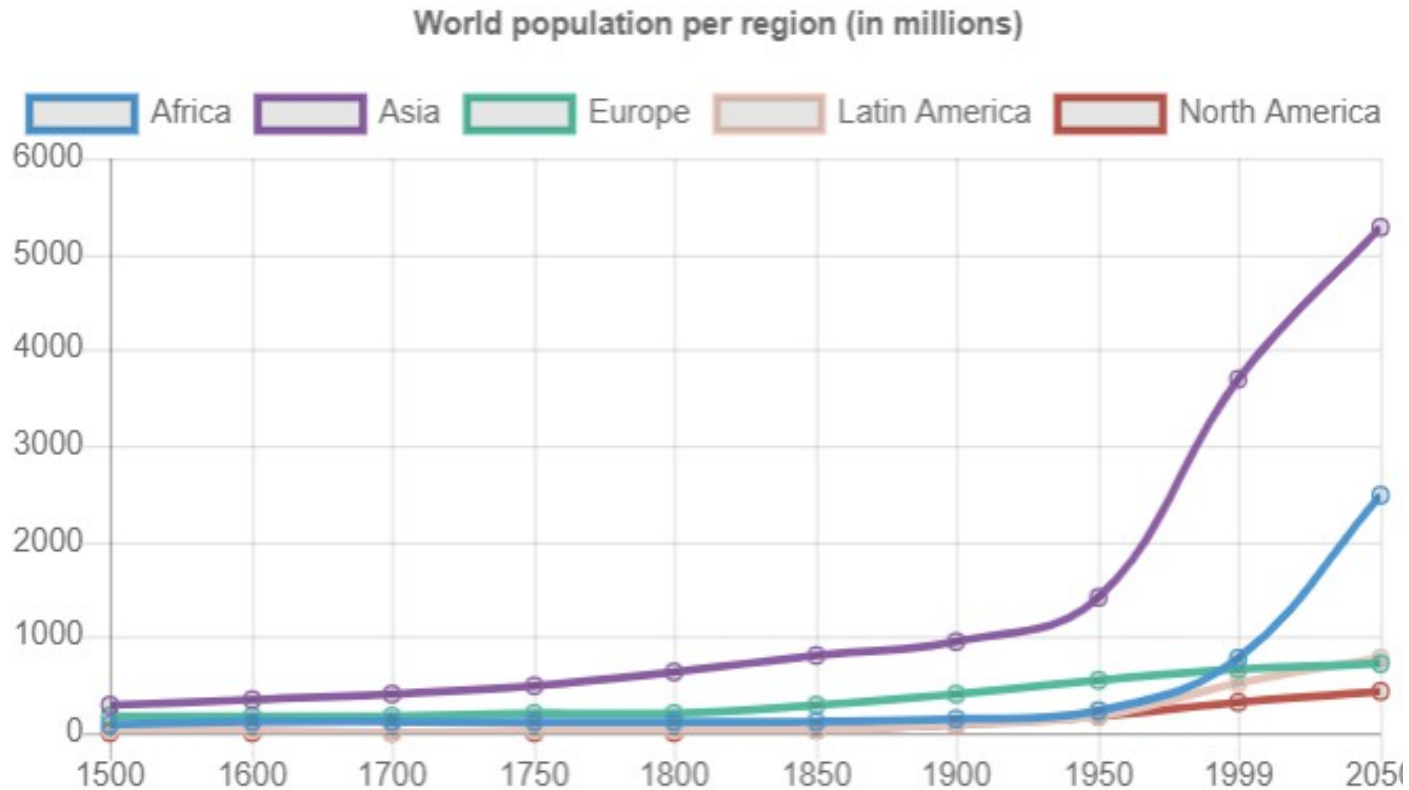
Example: [bar-chart.html](#)

Tobias Ahlin Blog: [Documentation for example](#)

Chart.js [documentation for Bar Charts](#)



# Chart.js Line Chart



Example: [line-chart.html](#)

Tobias Ahlin Blog: [Documentation for example](#)

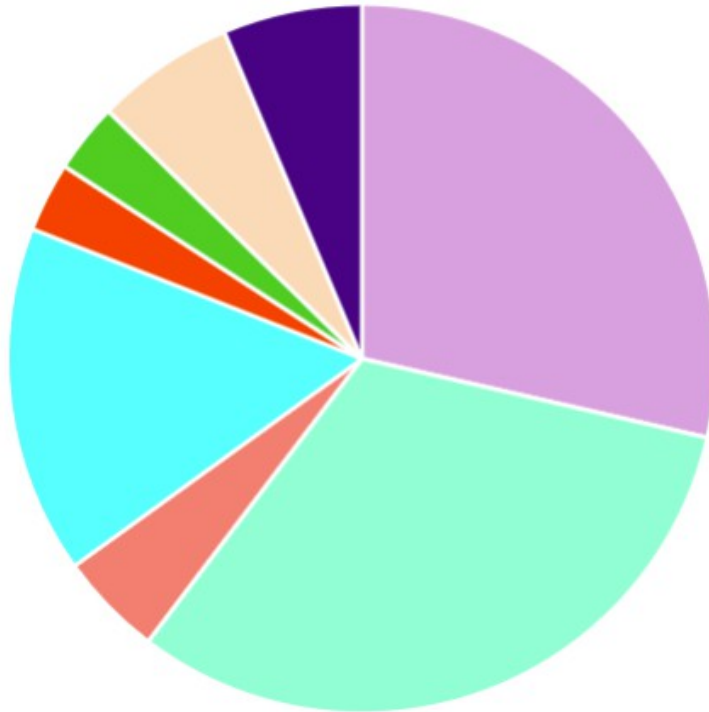
Chart.js [documentation for Bar Charts](#)

Part 1: Overview and Chart.js

**Part 2: Examples**

Part 3: And two more examples

# Example: Spoonacular API + Chart.js



- Each Spoonacular recipe supports one or more diets, as listed in the [diet definitions](#)
- Using the [complexSearch](#) API, and selecting the Thai cuisine, we can create a pie chart to illustrate the proportion of Thai recipes for various diets

```
https://api.spoonacular.com/recipes/complexSearch?  
cuisine=thai&  
addRecipeInformation=true&  
number=100&  
apiKey=my-api-key
```

Recipe-Chart folder

# Enhancement: User-selected Cuisine

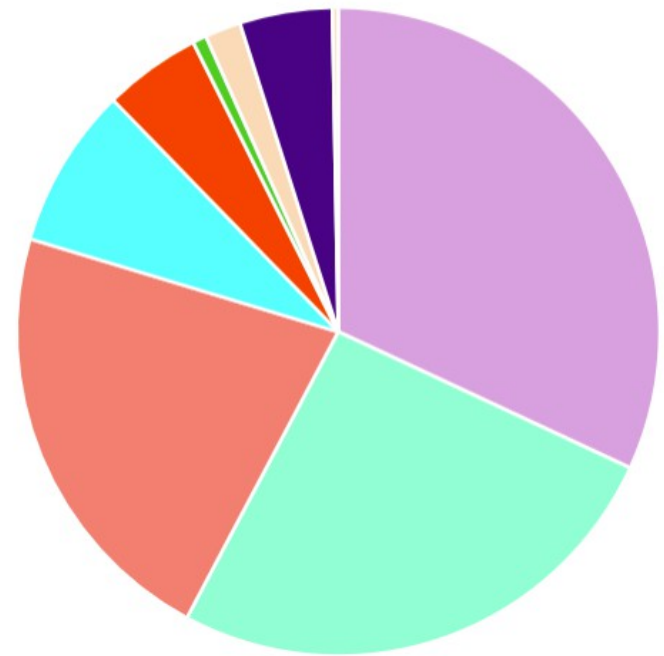
## Caribbean Recipes by Diet Types

### Recipes by Diet Types

Select Cuisine

- African
- American
- British
- Cajun
- Caribbean**
- Chinese
- Eastern European
- European
- French
- German
- Greek
- Indian
- Irish
- Italian
- Japanese
- Jewish
- Korean
- Latin American
- Mediterranean
- Mexican

Select Cuisine



Recipe-Chart-by-Cuisine folder

```
'https://api.spoonacular.com/recipes/complexSearch?cuisine=' + feature.value + '&addRecipeInformation=true&number=100&apiKey=my-api-key'
```


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# Many ways to visualize data...

**NASA's Mars Helicopter Completes First Flight on Another Planet**




By Kenneth C...

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




**Once Upon a Time on Mars**




By Dewair Overije

**NASA Sent a Secret Message to Mars. Meet the People Who Decoded It.**




**Almond Joy Protein Shake**




**Cuisines:** Southern  
**Diets:** gluten free, dairy free, fodmap friendly  
**Dish Types:** lunch, main course, main dish, dinner

**Southern Fried Catfish**




**Cuisines:** Southern  
**Diets:** dairy free, pescatarian  
**Dish Types:** lunch, main course, main dish, dinner

**Baked Fried Chicken With Cauliflower Mash**



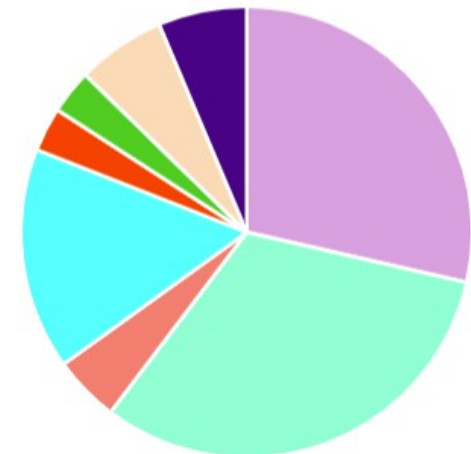
**Cuisines:** Southern  
**Diets:**  
**Dish Types:** lunch, main course, main dish, dinner

**Roasted Lemon Pepper Pork Tenderloin with Cornbread Stuffing**



**Cuisines:** Southern  
**Diets:**  
**Dish Types:** lunch, main course, main dish, dinner

Using HTML/CSS to render JSON data in a usable, informative way



Using Charting tools to summarize quantifiable information for improved understanding of the data

# Data Visualization for Mobile Web

## Can Data Visualization Improve The Mobile Web Experience? (Smashing Magazine)

### Some benefits

- Reduce the amount of space and time needed to get your point across
- Page design can be more visually engaging
- Preserve content parity for mobile and desktop visitors

### Some approaches

- Go beyond traditional data visualization formats
  - Different kinds of data worth turning into graphics
    - Statistical data,
    - Short bulleted lists,
    - Highly complex topics,
    - Step-by-step explainers,
    - Page or topic summaries.
  - Different [Visualization Types](#) (Duke University Libraries)
- Design your data visualizations to be filterable
- Make your data visualizations interactive

# Recipes by Cuisine

Cajun



Show recipes

## Red Kidney Bean Jambalaya



**Diets:** gluten free, dairy free, lacto ovo vegetarian, vegan

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

View Recipe Tastes

## Jean's Seafood Gumbo



**Diets:** dairy free

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

View Recipe Tastes



# Visualizing Recipe Information with Spoonacular API + HTML/CSS/JS + Chart.js

- Render recipe data (JSON) in a more informative, appealing way using HTML/CSS
- Recipe data is filterable (selectable by cuisine)
- Interactive: click to view Recipe tastes, and hover to view more chart detail



## NYT Articles Search

[Search](#)

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



By *Kenneth Chang*

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

[View Keywords](#)[Mars \(Planet\)](#)[Helicopters](#)[National Aeronautics and Space Administration](#)[Perseverance \(Mars Rover\)](#)[Space and Astronomy](#)

### Once Upon a Time on Mars



By *Dennis Overbye*

A dune buggy is about to set off on behalf of its human owners to fulfill a primordial yearning.

[View Keywords](#)

## Visualizing Article Information with NYT API + HTML/CSS/JS + Word Cloud

- Render article data (JSON) in a more informative way using HTML/CSS
- Article data is filterable (searchable by term)
- Interactive: click to view keywords associated with the article