Intro to Leaflet

Library Instructional Tech Training
UNC Greensboro

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Go to: go.uncg.edu/pomuwl

Right-click on the “Demo map files” folder to download, then unzip/extract.

Objectives

1. Learn what Leaflet is and why you would use it.

2. Explore the parts of a Leaflet map using an example.

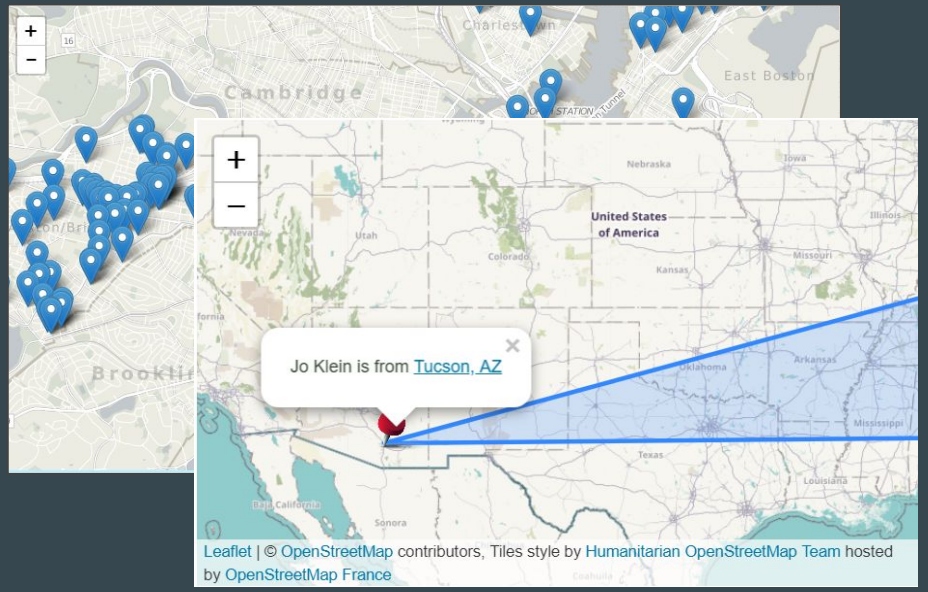
3. Learn how the Leaflet library is used by making changes to the example map.

What is Leaflet?

Leaflet is an open-source Javascript library for creating mobile-friendly interactive maps.

How is Leaflet used?

Leaflet code is used alongside HTML, CSS, and Javascript in web-page or app development.



Demo Map

What does Leaflet do?

- Showing and interacting
  - Panning
  - Zooming
- Tiled base layers
- Feature layers (from the user, i.e. you!)
- Mobile-friendly maps

What does Leaflet *not* do?

- Provide data
- Analyze data*
- Map projections & manipulations
- User interface*

*on its own

Why use Leaflet?

- If you want a simple interactive map without complicated software
- If you want to learn or teach web development and coding
  - HTML & CSS
  - Javascript/Javascript Object Notation (JSON)
- If you want to teach or practice implementation of accessibility & web design guidelines
  - Mobile-friendly and works across devices
  - Visual design elements
- If you want to explore web-scraping and use of API's.

Making a Leaflet Map

You'll Need:

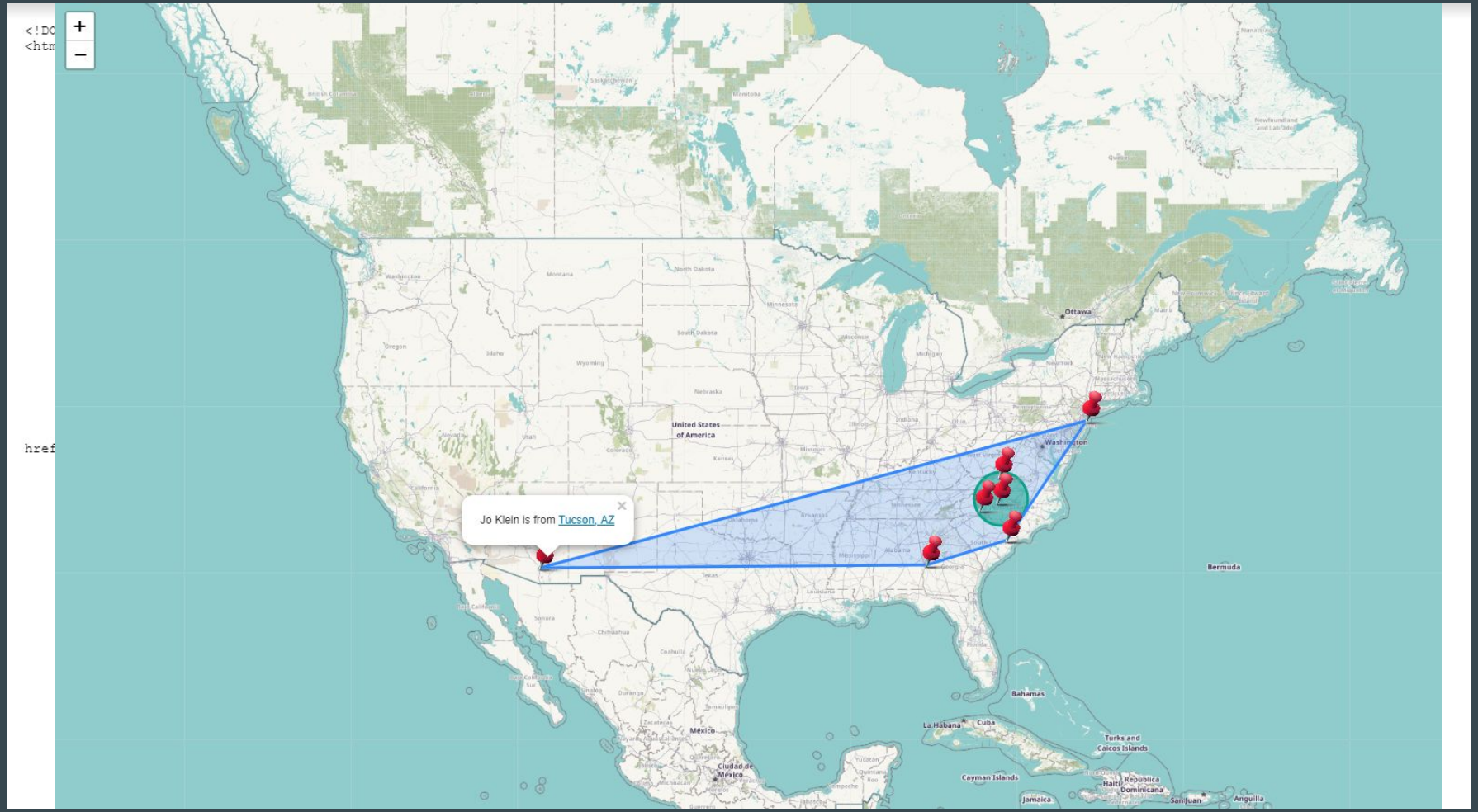
1. Text editor
   - Notepad (Windows)/TextEdit (Mac)
   - JS Fiddle (in-browser)
   - Sublime Text
2. Web browser
3. ~~Local web server~~
   - ~~Python's SimpleHTTPServer~~
   - ~~WampServer (Windows)/MAMP (Mac)~~

For next time

Parts of a Leaflet Map*:

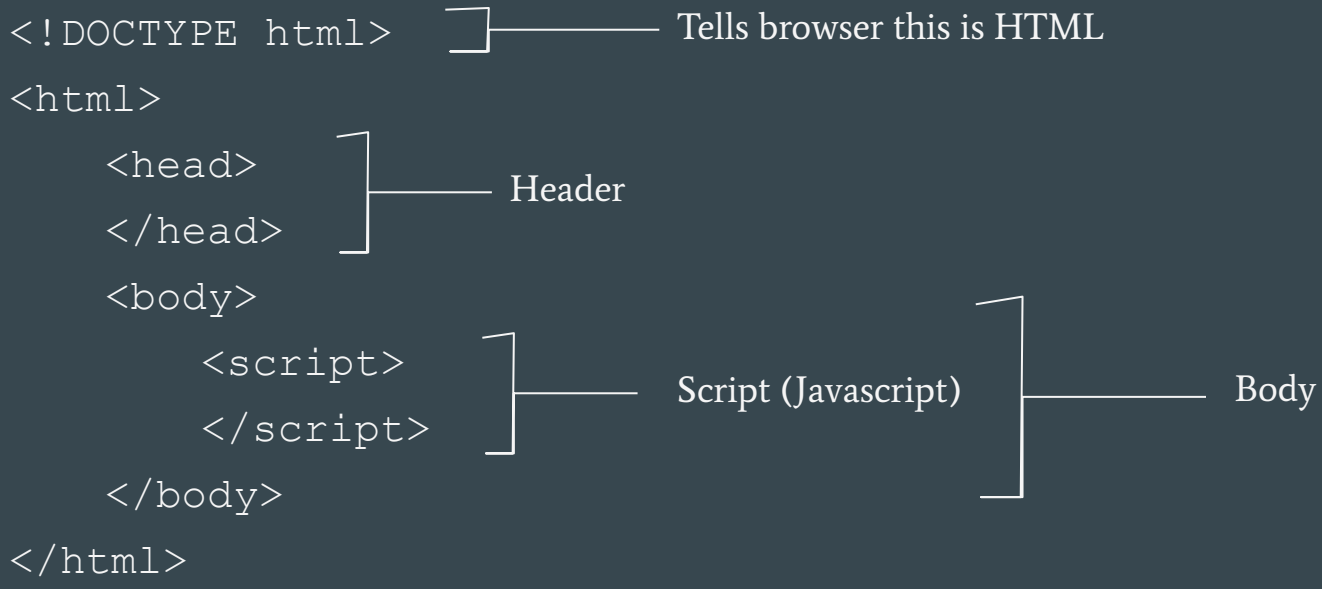
1. An HTML page
   - map-normal.html
   - map-watercolor.html
   - map-normal-easyview.html
2. Leaflet CSS styles
3. Leaflet JavaScript library
4. Images for custom markers (optional)

*Alternatively: Contents of the “Demo map files” Folder.



Google Drive preview of map-normal-formatted.html (which is map-normal.html without notes and indented for easier reading).

HTML Structure



Header

```
<head>
   <title>Sample Leaflet Map - Street Map</title>
   <meta charset="utf-8" />
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <link rel="shortcut icon" type="image/png" href="images/star.png"/>
   <link rel="stylesheet" href="css/leaflet.css">
   <link rel="stylesheet" href="css/styles.css">
   <script src="js/leaflet.js"></script>
   <script src="js/leaflet-providers.js"></script>
   <meta name="viewport" content="width=device-width, initial-scale=1.0,
   maximum-scale=1.0, user-scalable=no" />
</head>
```

Page title

Page icon*

Reference to CSS*

Reference to Javascript*

*From contents of folder

Body

```
<body>
        <div id="map"></div>
        <script>
             var mymap = L.map('map', {
                  minZoom: 4, zoomSnap: 0.25
                  });
             mymap.setView([39.069150, -95.665372], 4.5);
             var southWest = L.latLng(0,-180), northEast = L.latLng(80, -50);
             var bounds = L.latLngBounds(southWest, northEast);
             mymap.setMaxBounds(bounds);

             L.tileLayer.provider('OpenStreetMap.HOT', {
                  maxZoom: 10,
                  attribution: 'attribution-added-here'
                  }).addTo(mymap);
```

Container for map on page

Defines “mymap” variable

Sets initial view coordinates, zoom level

Adds basemap tile layer

Body

Adding Map Tiles

Leaflet Providers

What's an API key?

An application programming interface (API) key is a **unique identifier** used to **authenticate** a program, developer, or user to a website's API.

Commonly used to:

- Prevent malicious use or abuse of the API
- Identify the entity using the API.

Body > Markers

```
var testIcon = L.icon({
        iconUrl: 'images/red-icon.png',
        iconSize: [75, 75],
        popupAnchor:  [9, -12]
        });
```

Defines custom marker “testIcon”

```
var circle = L.circle([36.0697492, -79.8121722], {
        color: '#00A86B',
        fillColor: '#00A86B',
        fillOpacity: 0.5,
        radius: 160934.5 //100 miles converted to meters
        }).addTo(mymap);
```

Defines circle style and location

Adds to map

Body > Data & Popups

```
var joPop = '<p>Jo Klein is from <a
href="https://en.wikipedia.org/wiki/Tucson,_Arizona">Tucson, AZ</a></p>' ;

var jo = L.marker([32.22167, -110.92639], {icon:
testIcon}).bindPopup(joPop).addTo(mymap);
```

Text of popup “joPop”

Add custom “testIcon” marker with popup at our coordinates

```
    </script>
  </body>
</html>
```

Close out code

Adding Data

Common sources for coordinates:

- Google Maps
- Wikipedia
  - Tucson, Arizona on Wikipedia

Resources and Tutorials

- Maptime Boston: Leaflet intro
- MaptimeTO: Leaflet basics
- Leaflet