You'll get the most out of this talk if...

- You know HTML
- You know some Javascript
- You have a basic understanding of mapping (lat, long)
What we'll cover

- Simple embedded maps
- Controlling the map with OpenLayers
  - Controlling the view, zoom
  - Multiple layers
  - Multi-Marker maps
- Map searching
Adding a simple map to our web site

1) Pick an area you want to map on openstreetmap.org
2) Click Export on top
3) Paste the HTML snippet into your web page
4) Make yourself a peanut butter sandwich
Clicking Embed
What does that look like?

<html>
  <head>
    <title>My first embedded OpenStreetMap page</title>
  </head>
  <body>
    <iframe width="425" height="350" frameborder="0" scrolling="no"
      marginheight="0" marginwidth="0"
      style="border: 1px solid black"></iframe>
    <br />
    <small>
      <a href="http://www.openstreetmap.org/?lat=38.99434&lon=-77.03244&zoom=14&layers=M">View Larger Map</a>
    </small>
  </body>
</html>
And how does it look?
Adding a marker

- We want to add a marker (pin) to our map
- OSM's export allows us to to do that
Circling Back

• We've covered the most common use cases for embedding OSM
• Showing an area
• Placing a marker to indicate location
• OpenStreetMap.org makes this easy
Jargon

- *Tiles* – images in a slippy map
- *Render* – process of turning raw data into visual representation
- *Geocoding* – Location search. The locational result of a query
**OSM vs Commercial Mapping Services**

**Traditional Commercial Maps**
- Rendered maps
- Developer Key
- Single API
- Single provider

**OpenStreetMap**
- Rendered maps or raw data
- Multiple APIs
- No developer key needed
- Several providers (some free, some commercial
- Ability to roll your own
Mapstraction

- Mapstraction provides a single, simple overlay to multiple mapping providers
  - OpenStreetMap, Google, Yahoo
- Provides several abstractions for OSM
- Alternatively
  - OpenLayers, OpenIcon, Nominatim
- Recommended even if you're using another provider
Tiles

- A map is made up of many images called tiles
- The tiles are close together so they appear as a single image
- As the user scrolls across the map, new tiles are loaded
Layers

- A map layer consists of data from one datasource
- A map consists of one or more layers
- Layers are georectified (aligned) and projected on top of one another
Our First Map

- Create a div to hold the map
- Create a map associated with that div
- Add OSM as a layer to the map

```html
<div id="ourMap"></div>
<script src="http://www.openlayers.org/api/OpenLayers.js"></script>
<script>
    map = new OpenLayers.Map("ourMap");
    map.addLayer(new OpenLayers.Layer.OSM());
    map.zoomToMaxExtent();
</script>
```
Mapping a Specific Area

- Option 1: Selecting a point and zooming to it
  - Find the point you like
  - Specify the point as the center and manually specify zoom level

- Option 2: Zooming to an extent
  - Find the bounding box
  - Set the map to zoom there
    - Hope the zoom is what you want
Zooming to a specific object

- We have the lat/long of our object
  - If you don't know it, we'll discuss that later
- Create our map
- Transform our point to EPSG:4326
- Set the centerpoint and zoom

```javascript
map = new OpenLayers.Map("demoMap");
map.addLayer(new OpenLayers.Layer.OSM);
ourpoint = new OpenLayers.LonLat(-77.04, 38.99);
ourpoint.transform(new OpenLayers.Projection("EPSG:4326"), map.getProjectionObject());
map.setCenter(ourpoint, 17);
```
Finding the bounding box of an area

- We want to provide a map of a specific location
- First we have to define that area in terms of a *bounding box*
- If you don't know the boundaries, use OSM's export tab
- Export displays the top, right, left and bottom boundaries
Zooming to a bounding box

- Create our map
- Create our bounds
- Transform them
- Set the `zoomToExtent` and set it to try to get the closest zoom (defaults to false)
Adding a Marker and infobox to a map

- We want to create a marker (pin) on the map
  - We also want to set a title on the label
  - And some more detailed information on a popup box
- We need to make a new layer
- Set the label and info box
Adding our marker

- Make our map
- Set the default projection
- Set another projection
- Add our marker layer

```javascript
map = new OpenLayers.Map("map", {
    projection: "EPSG:900913",
    displayProjection: "EPSG:4326"});
map.addLayer(new
    OpenLayers.Layer.OSM());
var markers = new
    OpenLayers.Layer.Text(
  "text", {location: ".:/markers.txt",
    projection: map.displayProjection});
map.addLayer(markers);
map.zoomToMaxExtent();
```
OSM Search

- Search/Geocoding is included in OpenStreetMap
  - Called Nominatim
- Use it online:
  - http://nominatim.openstreetmap.org/search
- Pass it parameters:
  - `format = {xml|json|html}` (defaults to html)
  - `q = {my search parameter}`
  - `viewbox = {left,top,right,bottom}` – constrain search to a bounding box
- It also groks some special words as key/value pairs so “cafe” becomes amenity=cafe and some translation as well
A query to Nominatim

- I'm using Ruby RestClient
  - Use whatever you like. You could do it via Javascript too, if you knew more JS than me
- `result = RestClient.get('http://nominatim.openstreetmap.org/search', {:params => {:q => 'McDonalds Silver Spring MD', :format => 'json'}}).to_s`
- `results = JSON.parse(result.to_s)`
- Now we have our results in an array!
Analyzing a Result

{"lon":-77.030243,
 "place_id":9175196,
 "class":"amenity",
 "type":"fast_food",
 "osm_id":480594520,
 "display_name":"McDonalds, 8507, Colesville Road, Sligo, Washington, Montgomery County, 20910, Maryland, United States of America",
 "licence":"Data Copyright OpenStreetMap Contributors, Some Rights Reserved. CC-BY-SA 2.0.",
 "lat":38.9949658,
 "boundingbox": [38.9948654174805, 38.9950675964355, -77.0303497314453, -77.0301361083984],
 "osm_type":"node"}
Where to go from here?

- Mapping Libraries
- Rendering
- Implementing OSM in your environment
- Commercial Support
Mapping Libraries

• OpenLayers
  • We only barely scratched the surface

• Mapstraction
  • Easier to use, Much less mature

• Commercial Alternatives
  • CloudMade API
    - Uses OSM Data, comprehensive, easier to use, more featureful
  • Mapquest/AOL? Bing?
Rendering

• Commercial Rendering Services
  • Cloudmade

• Commercial Support
  • Several Companies (Geofabrik, others)

• DIY
  • Mapnik
  • OSMRender
Your Own OSM Service

- OSM Components
  - DB
  - Rails
  - Mapnik
  - Apache
  - Glue
Commercial Support

• Custom Rendering
  • Cloudmade offers custom tile rendering on their hardware

• OSM Support
  • Many individuals and companies offer support for installing/maintaining private OSM instances
  • Listed on the OSM Wiki
Thank You!