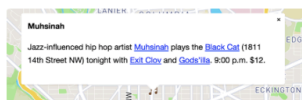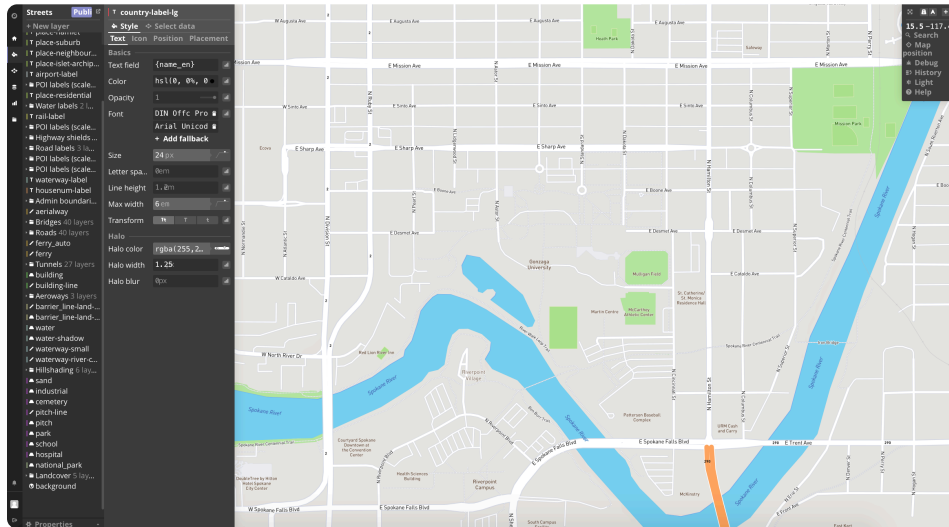Holly Schwartz
September 5, 2017
CPSC 491L
Week 1 Homework

After researching, I came to the conclusion that Mapbox is the tool to use for the AR Walking Tour
Application. This is because it is easy to implement with multiple different applications, we can
customize it to whatever we need, and seems to be the easiest to use.

Display a popup on click
When a user clicks a symbol, show a popup
containing more information
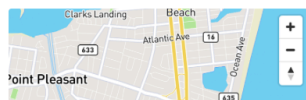
Add controls
Zoom and rotation controls to make map
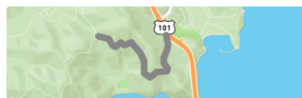navigation more obvious
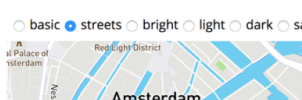
Style animation
Switch to another map style

Data-driven visualizations
Use a categorical circle-color property
function for a visualization

3D buildings
Use extrusions to display buildings' height in
3D

Add a GeoJSON line
Add a GeoJSON line to a map

- Mapbox (https://www.mapbox.com/pricing/)
    - Location data platform for mobile and web applications
    - 300 million people per month
    - Founded in 2010 in Washington DC
    - 218 employees
    - Open source company
        ‣ More than 660 public repositories on GitHub
    - Open source SDK lets developers add beautiful maps and turn-by-turn navigation to their apps that can go offline
    - mapbox studio
        ‣ Customize every aspect of your map
    - Turn-by-turn navigation
        ‣ With Navigation SDK, you can add traffic-aware turn-by-turn navigation to your app with just a few lines of code
    - Geocoding
        ‣ This library lets you turn coordinates into addresses into coordinates
    - Maps
        ‣ Super-high frame rate
            • Fluidly respond
            • Vector maps are 1/4 the size of traditional raster implementations
                - Greater cost savings
                - Greater performance in low-bandwidth
        ‣ Smooth transitions
        ‣ Access your data
            • Data for every feature in a vector map resides on the client not the server
        ‣ Dynamic design
            • Tweak colors
            • Hiding and showing specific layers
            • Choosing which information to present on your map
        ‣ Maps for navigation

- Mapping technology (http://www.encyclopedia.com/politics/encyclopedias-almanacs-transcripts-and-maps/mapping-technology)
  - broad term that describes the equipment and techniques used to prepare, analyze, and distribute maps of all kinds
    - Include:
      - Satellites used to obtain high resolution and multispectral data
      - Software to enhance or classify digital images
      - Global positioning system (GPS) satellites
      - Geographic information systems (GIS)
  - National Imagery and Mapping Agency
    - Formed in 1996
  - US Geological Survey
    - Civilian agency within the Department of the Interior
    - Produces detailed topographic and geologic maps of areas within the US
  - mapping technology is primarily used to gather data from which maps can be made
  - Technologies such as interferometric synthetic aperture radar (InSAR) can be used to create digital elevation models (DEMs) depicting the elevation of the Earth's surface and serve as the basis for detailed topographic maps
    - Shuttle Radar Topography Mission
      - Earth's land surface between 60 degrees north and 56 degrees south latitude
      - Detailed topographic information can be used to create topographic maps that are essential to military operations or to depict realistic landscape
  - Multispectral imagery is created using sensors that respond to different bands within the visible and invisible portions of the electromagnetic spectrum
  - GPS
    - 24 satellites orbiting Earth at an altitude of 20,200m
    - satellites issue signals that can be decoded by GPS receivers to determine the location of the receiver and the time within several hundred nanoseconds
  - GIS (Geographic information system) software
    - Allows users to digitally store, retrieve, analyze, and display maps of all kinds
    - Maps created using different scales or projections can be adjusted and combined to form new composite maps that answer specific questions
    - GIS is likewise useful for homeland security projects such as constructing maps of critical infrastructure, developing emergency response plans, and evaluating the consequences of terrorist attacks
- Indoor mapping technology (https://www.theprimacy.com/blog/indoor-mapping-technology/)
  - More than 40 companies offer indoor mapping and location products
    - Mobile titans:
      - Google
      - Apple
      - Microsoft
    - We spend more than 80% of our time indoors and given the fact that our smartphones are usually with us
  - The big players
    - Apple
      - WifiSlam: a company that offers indoor mapping services through the use of Wifi signals
        - Location accuracy is further enhanced by utilizing the smartphone's Compass and Accelerometer as they get closer to a WiFi hotspots
    - Microsoft and Nokia
      - Technology that uses Bluetooth beacons which beam signals to a smartphone app, which then updates a user's location on a map
        - More than 3,000 facilities
    - Google
      - Similar to apple
      - More than 10,000 maps have been added from US and international facilities
  - Watch out for independents
    - ByteLight
    - ConnectQuest
- MapServer (http://www.mapserver.org/about.html#about)
  - Open source platform for publishing spatial data and interactive mapping applications
  - Written in C
  - Create geographic image maps that are maps that can direct users to content
  - Developed by the University of Minnesota ForNet project in cooperation with NASA
  - Advanced cartographic output
    - Scale dependent feature drawing and application execution
    - Feature labeling
    - Fully customizable, template driven output
    - TrueTpe fonts
    - Map element automation
  - Supports
    - PHP
    - Python
    - Perl
    - Ruby
    - Java
    - .NET
  - Cross-platform support
    - Linuz
    - Windows
    - Mac OS X
    - Solaris
    - Etc
- http://nextjuggernaut.com/blog/google-vs-mapbox/
  - 3 factors that have enabled the on demand economy through mapping tech
    - Transparency

- - Real time updates on map view of both the service provider's location and the job status
  - ‣ Optimized routes
    - • Can calculate the shortest routes for delivery and the cost associated with such a job
  - ‣ Certainty
    - • Customers can see the service/provider live on a map view approaching their location
- ○ How do Google and Mapbox compare?
  - ‣ Pricing
    - • Google Maps API offers 2,500 map loads per day free of cost
    - • Charged $0.50 per 1,000 additional requests up to 100,000 requests per API per day
    - • Map box offers 50,000 views/month for $50 with 3 custom styles
  - ‣ Customization
    - • Ability to upload 3 custom styles
    - • Built its tech on OpenMapStreet data
    - • Customization is its core strength
  - ‣ Accuracy
    - • Google is more accurate than Mapbox
  - ‣ Associated services
    - • Google maps API has built in services which Mapbox does not
    - • EX:
      - ○ Places
      - ○ Business
      - ○ Streetview
      - ○ Satellite Imagery
      - ○ Etc
- ○ Components of digital mapping
  - ‣ Expected time of arrival
  - ‣ Real time tracking
  - ‣ Turn by turn navigation
  - ‣ Routing/cost
  - ‣ Off site services