UW Alerts

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Background and Use Case

- An interactive map that displays incidents/announcements from the UW Alerts system
- 3 main components:
  - Web app that hosts the map
  - Visualizations on the map
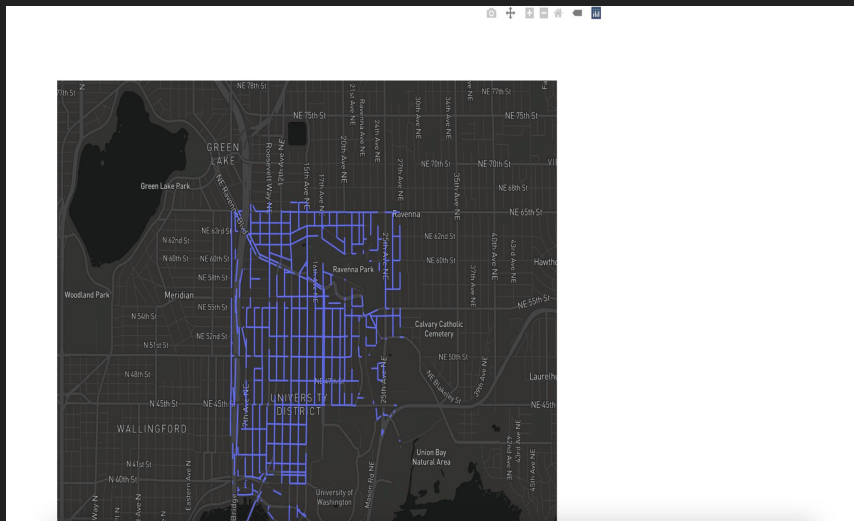 - Text parser to process UW Alerts message

Python Package Choices

- Flask vs Dash
- Plotly vs Folium
- OpenAI GPT3 API vs Regex

Package Comparison: Dash vs Flask

- Flask is a python web framework that allows for easy web application development provided that the user is familiar with front end technologies such as HTML, CSS, and Javascript. Flask was created by Armin Ronacher.
- Dash is a python framework that is built on top of flask that allows for quick data dashboarding, without the need for knowledge of front end technologies. Dash was created by Plotly.
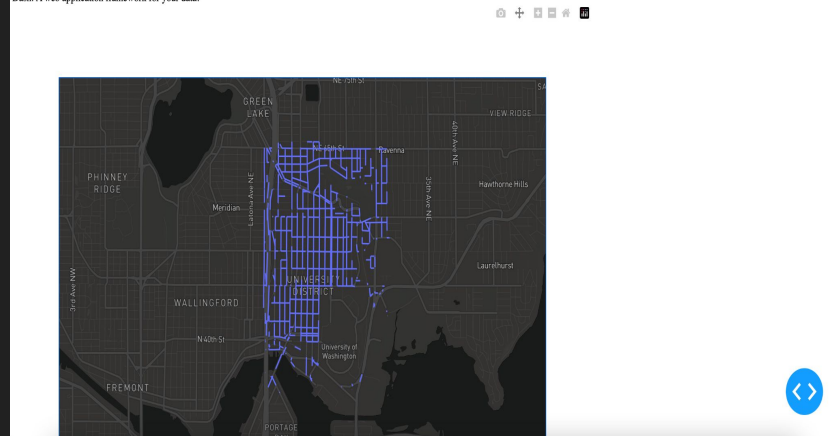
Implementation of Flask App

Implementation of Dash App

Dash vs. Flask

- As we can see, both dash and flask are remarkably similar for simple web applications
- Upon researching the use cases of both, dash seems to be used for data dashboarding, while flask is a generic web framework that allows custom components to be built.
- Since our team is comfortable with front end technologies (HTML, CSS, JS), and future goals may include user authentication and database integration, it seems better to go with flask for a higher level of customization.
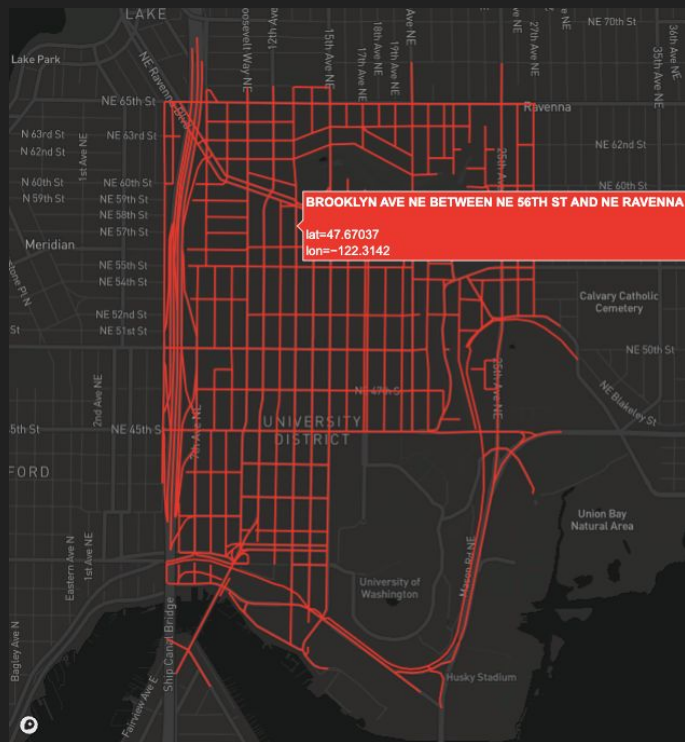
Package Comparison: Plotly vs. Folium

Plotly is a plotting/graphing library for interactive graphs and maps. Plotly was founded by A. Johnson, J. Parmer, C. Parmer, and M. Sundquist
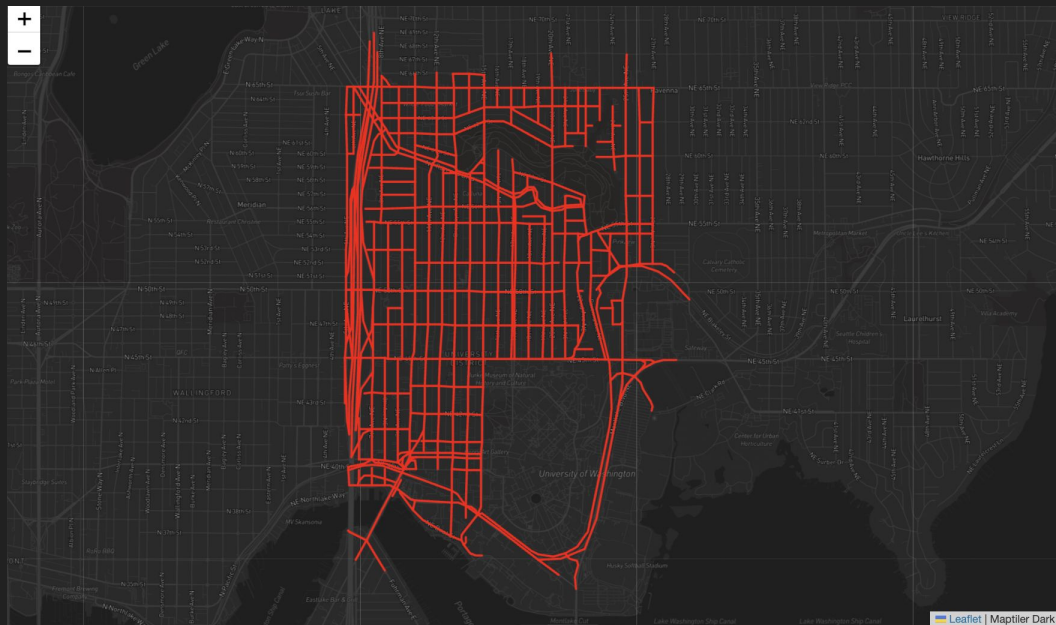
Folium has tools to visualize data that's been manipulated in Python on an interactive leaflet map. Folium was created by Rob Story.

Package Comparison: Plotly vs. Folium

Plotly example

Folium example

Plotly vs. Folium

- Both libraries allow the user to create interactive maps with overlaid elements such as heatmaps and markers.
- Plotly is more compatible with web-based visualizations than folium. It also has a larger community with resources and tutorials.
- Folium has more flexible tools and customizable drawing. It also enables custom markers which display html popups for tooltips.

With these factors in mind, our team valued the information that Folium can display on our application and proceeded accordingly.

Package Comparison: GPT3 vs Regex

- Initial plan was to use regular expressions to parse UW Alerts text messages. RegEx was created by Stephen Cole Kleene in the 1950s
- Irregular text format from manual entry and the wide range of message types made it difficult to efficiently extract information from UW Alerts
- OpenAI's GPT3 can easily extract tables from input UW Alerts text messages

Package Comparison: GPT3 vs Regex

Extract a markdown table with the columns date, report time, incident time, location, incident category, and summarized alert message from the alert messages below.
Text: """
October 18, 2022

UW Alert Seattle
UPDATE at 12:01 p.m. Tuesday: A person was sitting in a truck inside the Portage Bay Garage when a man knocked on the window to ask the time. The person gave him the time and then he became agitated, pulled a knife and scratched at the back of the truck. The person in the truck threatened to call the police and the man wielding the knife left the area, stabbing at a sign on the way out of the garage and fleeing northbound on 15th Ave. NE.

The man is described as having a slim build, possibly wearing a hat and possibly wearing a jacket. Please be alert to your surroundings if you are in the area.

ORIGINAL POST: Man made threats, pulled knife in Portage Bay Garage. No injuries. Suspect fled north on 15th Ave NE. Info: alert.uw.edu
Sent @ 11:57am Tue
"""

Package Comparison: GPT3 vs Regex

	Date	Report Time	Incident Time	Location	Incident Category	Summarized Alert Message
	Oct 18, 2022	12:01 p.m.	Not specified	Portage Bay Garage, Seattle	Threats, Knife Attack	Man made threats, pulled knife in Portage Bay Garage. No injuries. Suspect fled north on 15th Ave NE.

Our Package Choices

- Flask
  - Our application's goal to be accessible and interactive
  - Ability to horizontally scale features in the future
- Folium
  - Can draw elements overlaid on map
  - Emables html popups we can use to describe incidents when clicked on
- OpenAI GPT3
  - Can parse through many types of text with a high degree of accuracy
  - Little code needed to set up requests using the API

Drawbacks/Remaining Concerns

- OpenAI GTP3:
    - Requires additional checks to ensure that text parsing was successful
    - E.g. date extraction, street address location
- Folium
    - Bigger learning curve, requires knowledge of html
    - Quality:
        - Currently has loading/buffering issues in map

Package Demo