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SoftDev

P02

Target ship date: 2023-05-15

Program Description:

App that displays a map of NYC populated with data on crime in the city over layed with additional info on the city like socioeconomic demographics. This visualization of information can help gauge the relative safety of certain areas in NYC based on various indexes.

"Launch Codes" with subsections:

- How to clone/install.
- How to run.

Program Components:

A. __init__.py
    a. @app.route("/"):
        i. redirect to /login
    b. @app.route("/login"):
        i. renders login.html
        ii. login form: username & password
            1. check for existence of username and validity of password
    c. @app.route("/register"):
        i. renders register.html
        ii. register form: username & password
            1. check for availability of username
            2. if account is successfully created, information is stored in database
    d. @app.route("/home")
        i. renders our how-to page for using our app
        ii. directs to map page
    e. @app.route("/map"):

        i. renders map.html with the interactive map and interactive features

B. database.py

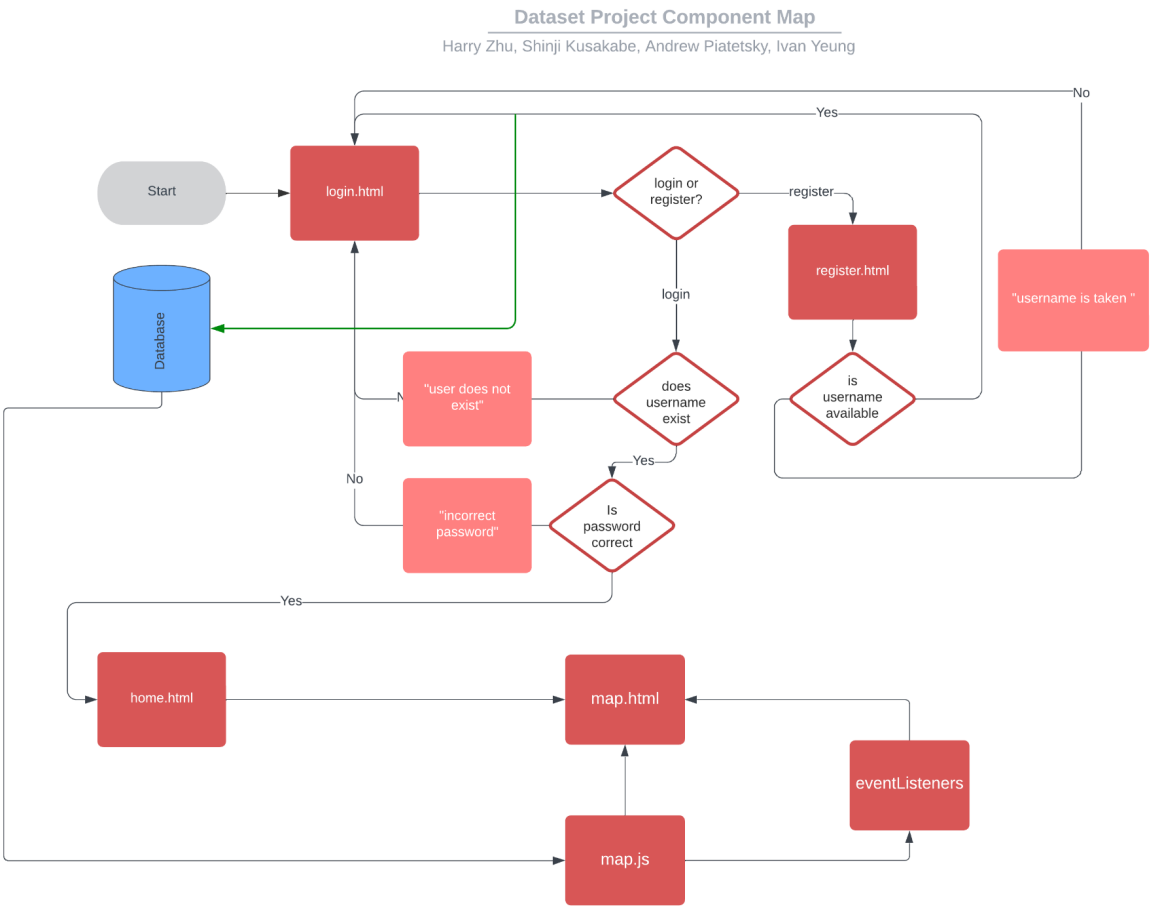
    a. get_uid(username): Retrieves user id from username
    b. get_password(username): Retrieves password from username
    c. check_username(username): Returns whether or not user already exists
    d. add_user(username, password): Add user credentials to table
    e. populate_database(): Populate database to prepare for use of app

C. static/
    a. css/
        i. home.css
        ii. map.css
        iii. login.css
        iv. register.css
    b. js/
        i. map.js
            1. script that helps populate the interactive map based on different buttons/sliders that user messes with
            2. Option to create a heatmap based on dataset
            3. Option to indicate exact locations of incidents with markers

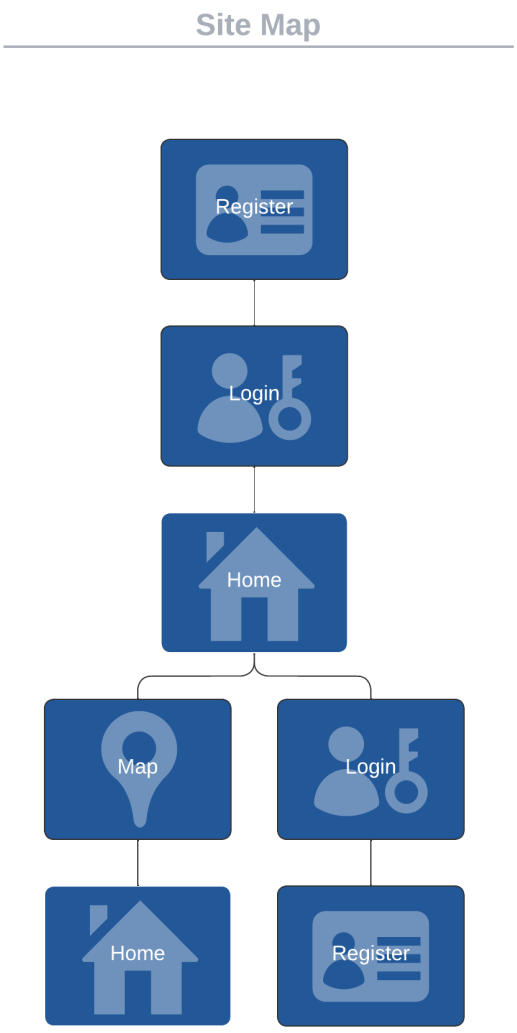
D. templates/
    a. home.html
        i. Team name, devo names, project names, and how-to use our app
    b. map.html
        i. Map with sliders, buttons, and search features
    c. login.html
        i. Login page
    d. register.html
        i. Registration page

E. keys/

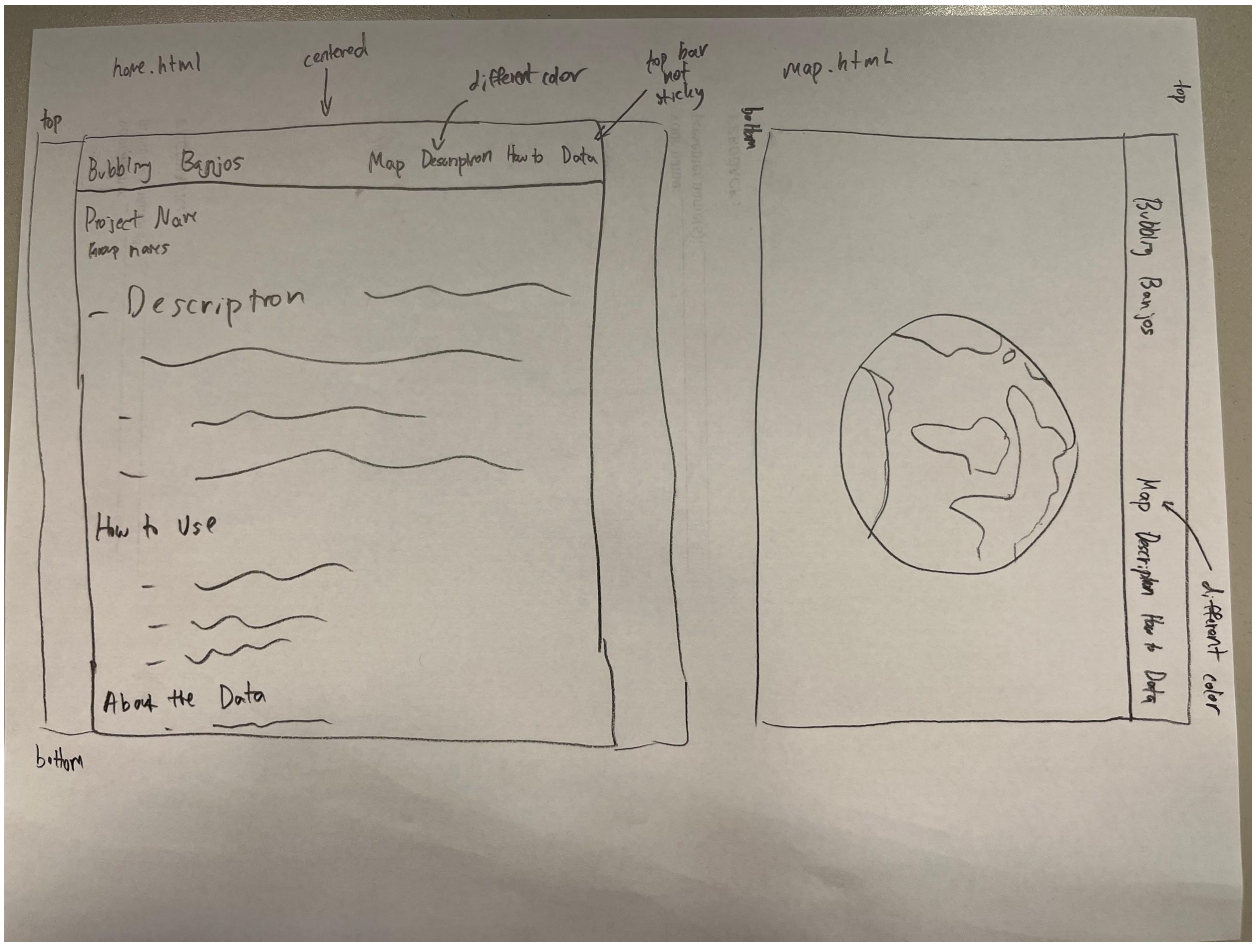
Component Interactions/Component Map:



Sitemap



Front End (How it will look):



Possible visualization options include a heatmap mode of the frequency/density of incidents in a certain location, an incident mode that just shows every incident that occurred on the map, and the ability to toggle on/off certain incidents (like ignore hate crime and arrest information on the map).

Tools/APIs:

- Maptiler Docs
- Maptiler Raster Image

- MapTiler Vector Tiles in Leaflet JS
- Maptiler Account Details:
    - *Email for API:* bubbanjos@gmail.com
    - *Password:* (<-- highlight to see)
    - This API will be used to create a map for our project that we will layer information on in many forms and with many different filters that the user will be able to use.
- https://data.cityofnewyork.us/login
- NYC Open Data Account Details:
    - *Email for NYC Open Data Account:* bubbanjos@gmail.com
    - *Password:* (<-- highlight to see)
    - This account will allow us to create an app token to use the APIs provided by by NYC Open Data

Datasets:

Note: If we have datasets that use different location storage systems, we can try using a geocoding service:

- Geocoding: You can use a geocoding service or library to convert addresses, zip codes, and precincts into latitude and longitude coordinates, which can be used to plot the location on a map. Services like Google Maps, OpenStreetMap, or Geopy provide APIs that allow you to query their databases for geolocation data.

(thanks to ChatGPT)

- NYC OPEN DATA: https://opendata.cityofnewyork.us/

- NYC motor vehicle collisions (The Motor Vehicle Collisions crash table contains details on the crash event. Each row represents a crash event. The Motor Vehicle Collisions data tables contain information from all police reported motor vehicle collisions in NYC)
    - details on the specific vehicles involved in collisions
- NYC hate crimes (Dataset containing confirmed hate crime incidents in NYC, doesn't have latitude, longitude)
- NYC shooting incidents (List of every shooting incident that occurred in NYC going back to 2006 through the end of the previous calendar year)
- NYC arrest data (List of every arrest in NYC going back to 2006 through the end of the previous calendar year)
- Demographics by zip code (Dataset contains demographic breakdown of only DYCD-funded participants within a Zip Code of NYC. Displays the counts and percentages of gender, ethnicity, and race)

Database Organization

NYC motor collisions

DATE	TIME	BOROUGH	ZIP CODE	LATITUDE	LONGITUDE	LOCATION

NYC hate crimes

YEAR	MONTH	OFFENSE	CRIME DESC.	PRECINCT	BOROUGH

NYC shooting incidents

DATE	TIME	BORO.	LON LAT	PERP AGE	PERP SEX	PERP RACE	VIC AGE	VIC SEX	VIC RACE

NYC arrest data

DATE	OFNS DESC.	LAW CODE	LEVEL OF OFNS	BORO	LON LAT	ARREST PRECINCT	PERP AGE	PERP SEX	PERP RACE

Demographics by zip code

ZIP CODE	FEMALE COUNT	FEMALE %	MALE COUNT	MALE %	GENDER NON CONFORMING COUNT	GNC %

American Indian or Alaskan Native	Asian	Black or African American	Multi-race	Native Hawaiian or Pacific Islander	White or Caucasian	Hispanic or Latinx	Two Spirit (Native American/ First Nations)	Middle Eastern and North African

*there will be a field for count and percentage for each race/ethnicity

Roles:

Front End (map api) - Andrew

Database / API (read data into sqlite) - Shinji

Middleware (Python and Flask) - Ivan, Harry