The Squirrels of Central Park NYC

Central Park

https://www.introducingnewyork.com/central-park

- Central Park is an urban park in New York City, 4km’s long and 0.8km wide.
- At 843 acres, it is the fifth largest park in the city.
- And the most visited urban park in the United States.

Source: https://en.wikipedia.org/wiki/Central_Park
https://www.centralpark.com/visitor-info/get-directions/

Purpose

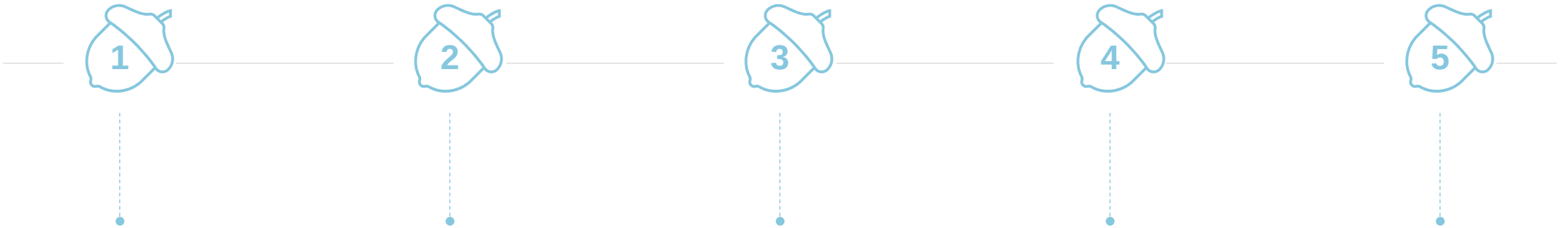
To understand the type of squirrels in Central Park, where they are located, and behaviour they exhibit.

Objectives

To understand…

1. Where the squirrels are located
2. Type of squirrels in terms of colour and age
3. Behaviour being exhibited at time of observation

5 key stages



1. Sourcing Data
2. Database setup & data cleaning
3. Analysis
4. Flask API
5. Visualisation

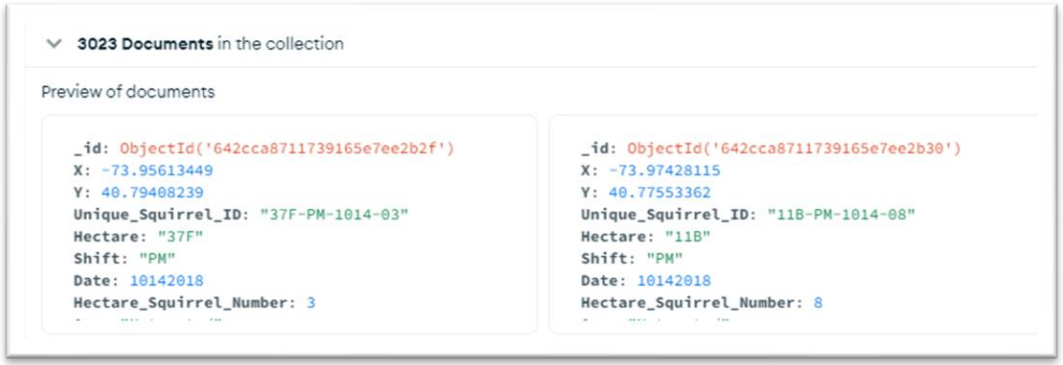
1 Sourcing Data

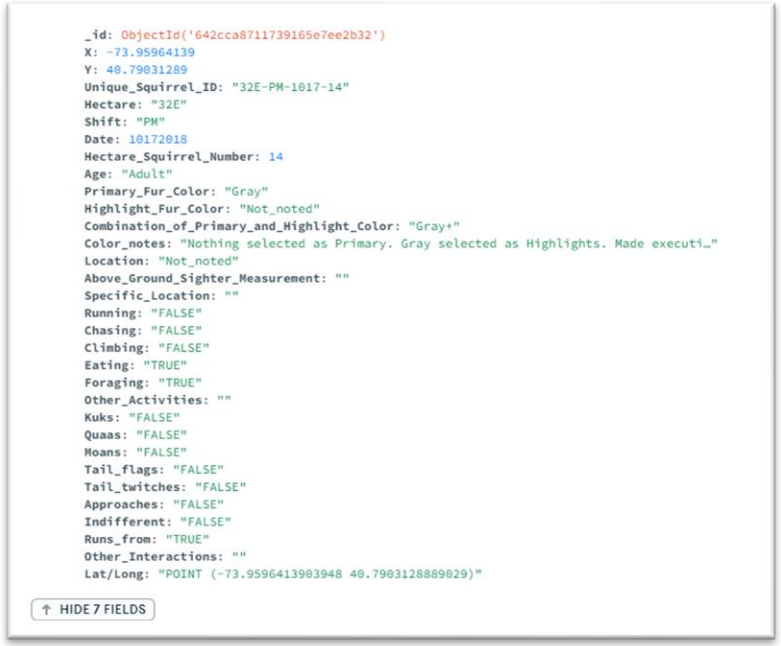
Source	NYC Open Data – 2018 Central Park Squirrel Census https://data.cityofnewyork.us/Environment/2018-Central-Park-Squirrel-Census-Squirrel-Data/vfnx-vebw
How	323 volunteers, clubs and government agencies counted squirrels and collected observational data in Central Park New York
When it was collected	Data Collection occurred in October 2018.
Size of dataset	Dataset contains information on 3,023 squirrels
Format	CSV file downloaded from The City of New York website.

2 Database set up & data cleaning

The CSV file was imported into MongoDB

mongoimport --type csv -d squirrels_db -c squirrels --headerline --drop 2018_Central_Park_Squirrel_Census_-_Squirrel_Data.csv





2 Database set up and data cleaning

Number of documents	- Checked the number of documents was equal to 3,023 the total number in the csv file.
Unique Squirrel ID	- Identification tag for each squirrel sighted. - In reviewing the data, there were five Unique Squirrel ID's that appeared twice in the data set. - For each of the duplicates the data was the same, except for longitude and latitude which was slightly different. The decision made to retain these duplicates in the dataset.
Missing data	- The main aspect of data cleaning was fields missing data. - Updated fields with no data with 'Not_noted' to aid analysis later on.
Reviewed all relevant fields	- To ensure the data contained was as expected and fit for purpose.

3 Analysis

Focus at this stage was running the data to better understand it and start to formulate a story, specifically:

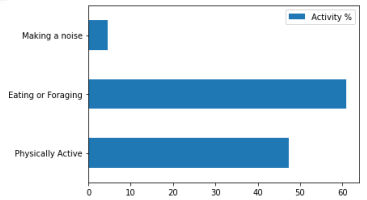
- The **types of squirrels** found in Central park, based on primary fur colour and age
- Where they are **located** and whether this differs by squirrel type.
- **Behaviour** they were undertaking when observed, in terms of eating, movement, and making noises.

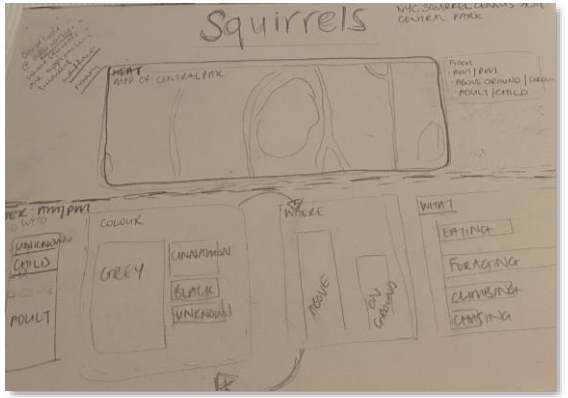
- From this an initial version of the **data visualisation was mapped out**, along with the data that would be required from the **flask app**.

	_id	count
0	Adult	2568
1	Juvenile	330
2	Not_noted	125

	_id	count
0	Ground Plane	2116
1	Above Ground	843
2	Not_noted	64

	_id	count
0	PM	1676
1	AM	1347

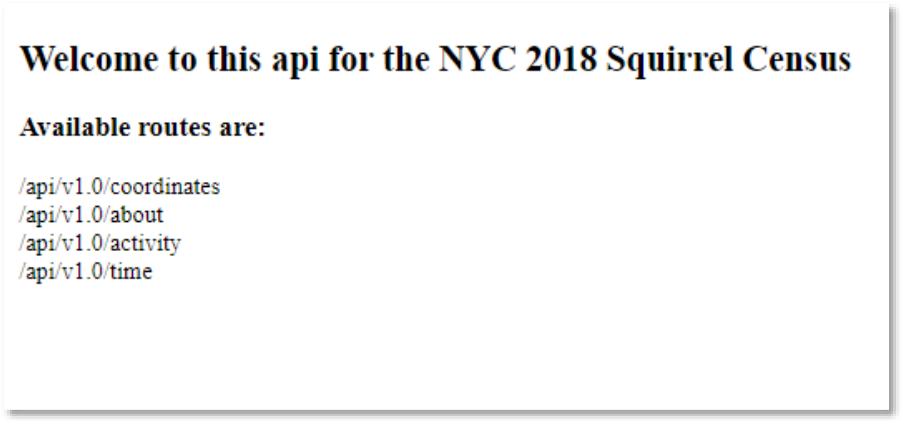




4 Flask APP

Four routes were required for the data visualisation:

1. **coordinates** - Latitude and Longitude data for each squirrel, along with squirrel colour and time of sighting
2. **about** - Covering fur colour, age and where the squirrel was (on or above ground)
3. **activity** - Data on movement, eating, and noises.
4. **time** – The time (AM or PM) the squirrel was observed



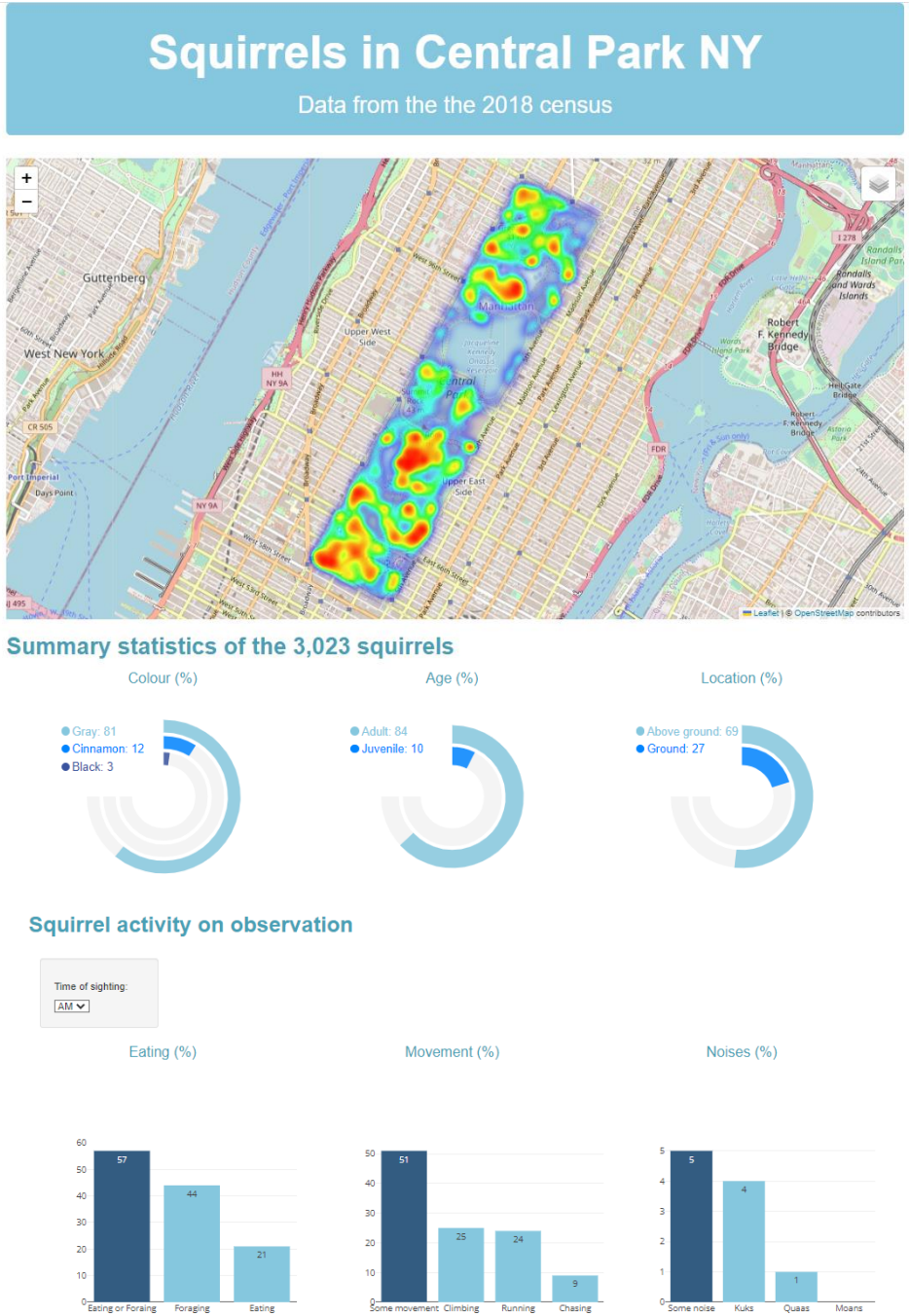
5 Visualisation

The visualisation was completed using JavaScript, html, and css.
Multiple JS libraries were used:

- Leaflet for the heatmap
- Apex charts for the radial bar charts
- Plotly for the bar charts

Users can interact with the charts via multiple ways:

- Select different layers on the heatmap
- Click on and off bars on the radial bar charts
- Select a time to display the data on squirrel activity



Findings

Location

Gray squirrels

Gray squirrels can be found throughout the park, with a higher concentration in the southern part of the park.

Cinnamon squirrels

Cinnamon squirrels are largely concentrated in the south west corner of the park

Black squirrels

Black squirrels are concentrated in the North Meadow, near the Recreation Center.

Colour	- **Gray squirrels** are the **most prevalent**, making up 82% of all squirrels in the park. - Cinnamon coloured squirrels are less common, making up 13%. - Followed by the mysterious black squirrel who make up only 3% of all squirrels in the park
Age	- **Adult squirrels** make up the majority of those in the park at **85%** - While juvenile squirrels consist of 11% total squirrels.
Ground level or above	- **Squirrels** were **largely observed above ground** (at 70%). - While just under a third were sighted at ground level.

Behaviour	- The **most common** behaviour observed was **foraging and or eating**.
	  - Foraging and eating was slightly higher amongst squirrels observed in the afternoon.
	- **Movement** (notably climbing and running) was the next most common behaviour.
	  - Movement was slightly higher amongst squirrels observed in the morning.
	- Only a small portion of squirrels were heard to be making a **noise** when found.
	  - No difference between squirrels observed in the morning or afternoon.