Exceptional Trees of Oahu
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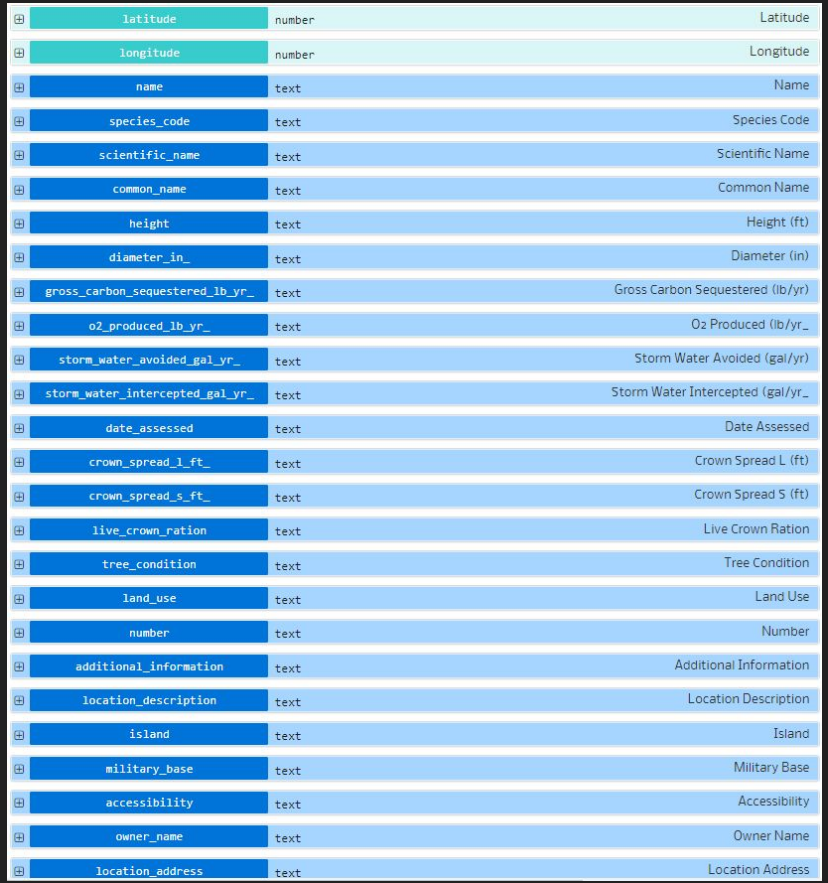
Candace Edwards

Data Overview:

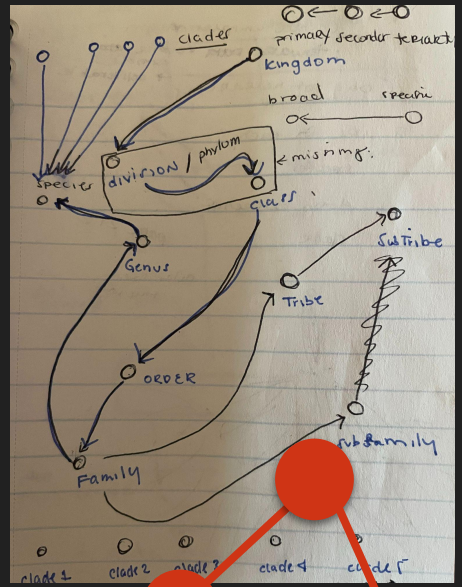
- API: Exceptional Trees of Oahu
- API Source: https://dev.socrata.com/foundry/data.honolulu.gov/84fd-3fzf
- Formats: JSON, GeoJSON, CSV, XML
- 35+ Data attributes including :
  - Latitude/Longitude
  - Scientific Name
  - Diameter
  - Oxygen produced per pound per year
- Original Data Source: data.honolulu.gov



latitude	number	Latitude
longitude	number	Longitude
name	text	Name
species_code	text	Species Code
scientific_name	text	Scientific Name
common_name	text	Common Name
height	text	Height (ft)
diameter_in_	text	Diameter (in)
gross_carbon_sequestered_lb_yr_	text	Gross Carbon Sequestered (lb/yr)
o2_produced_lb_yr_	text	O2 Produced (lb/yr_
storm_water_avoided_gal_yr_	text	Storm Water Avoided (gal/yr)
storm_water_intercepted_gal_yr_	text	Storm Water Intercepted (gal/yr_
date_assessed	text	Date Assessed
crown_spread_l_ft_	text	Crown Spread L (ft)
crown_spread_s_ft_	text	Crown Spread S (ft)
live_crown_ration	text	Live Crown Ration
tree_condition	text	Tree Condition
land_use	text	Land Use
number	text	Number
additional_information	text	Additional Information
location_description	text	Location Description
island	text	Island
military_base	text	Military Base
accessibility	text	Accessibility
owner_name	text	Owner Name
location_address	text	Location Address

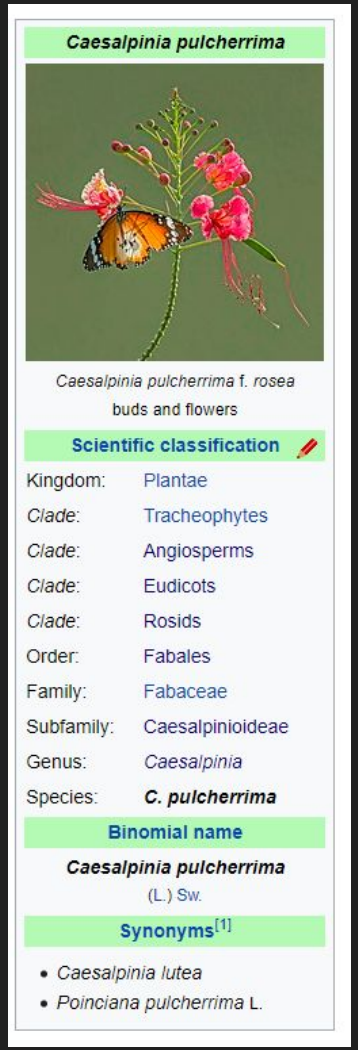
Taxonomic Classification : Overview

- Purpose/ Question:
  - Create a visual representation of the taxonomic hierarchy of trees in the API to reveal relationship between trees.
  - How are the trees in the API related to each other?
- Approach:
  - Create a Tree (Directed Acyclic Graph) of trees' taxonomic classifications
  - Kingdom → Species (broad → specific)



Taxonomic Classification: Process

- Tools:
  - Python, Excel, SigmaJS, Gephi, Graphia
- Process:
  - Tree Data: Pulled data from API
  - Taxonomic Data: Scraped from wiki
  - Node and Edge List:
    - Nodes = classification levels
    - Edges = relationships
  - Modified visualization: layout algorithms, colors, sizing



Caesalpinia pulcherrima

Caesalpinia pulcherrima f. *rosea*
buds and flowers

Scientific classification

Kingdom:	Plantae
Clade:	Tracheophytes
Clade:	Angiosperms
Clade:	Eudicots
Clade:	Rosids
Order:	Fabales
Family:	Fabaceae
Subfamily:	Caesalpinioideae
Genus:	*Caesalpinia*
Species:	***C. pulcherrima***

Binomial name

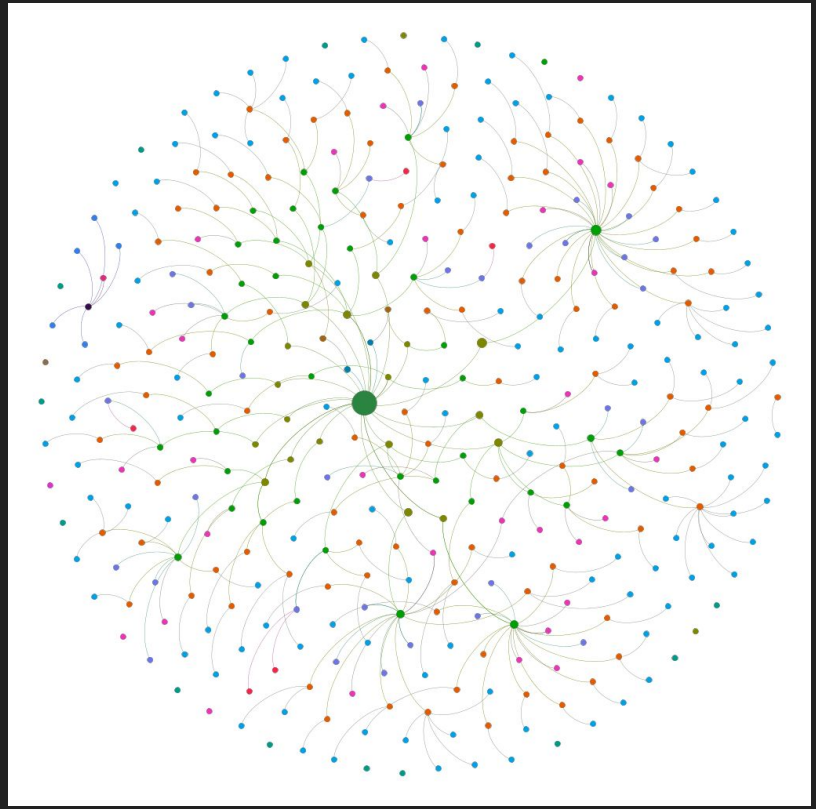
Caesalpinia pulcherrima
(L.) Sw.

Synonyms[1]

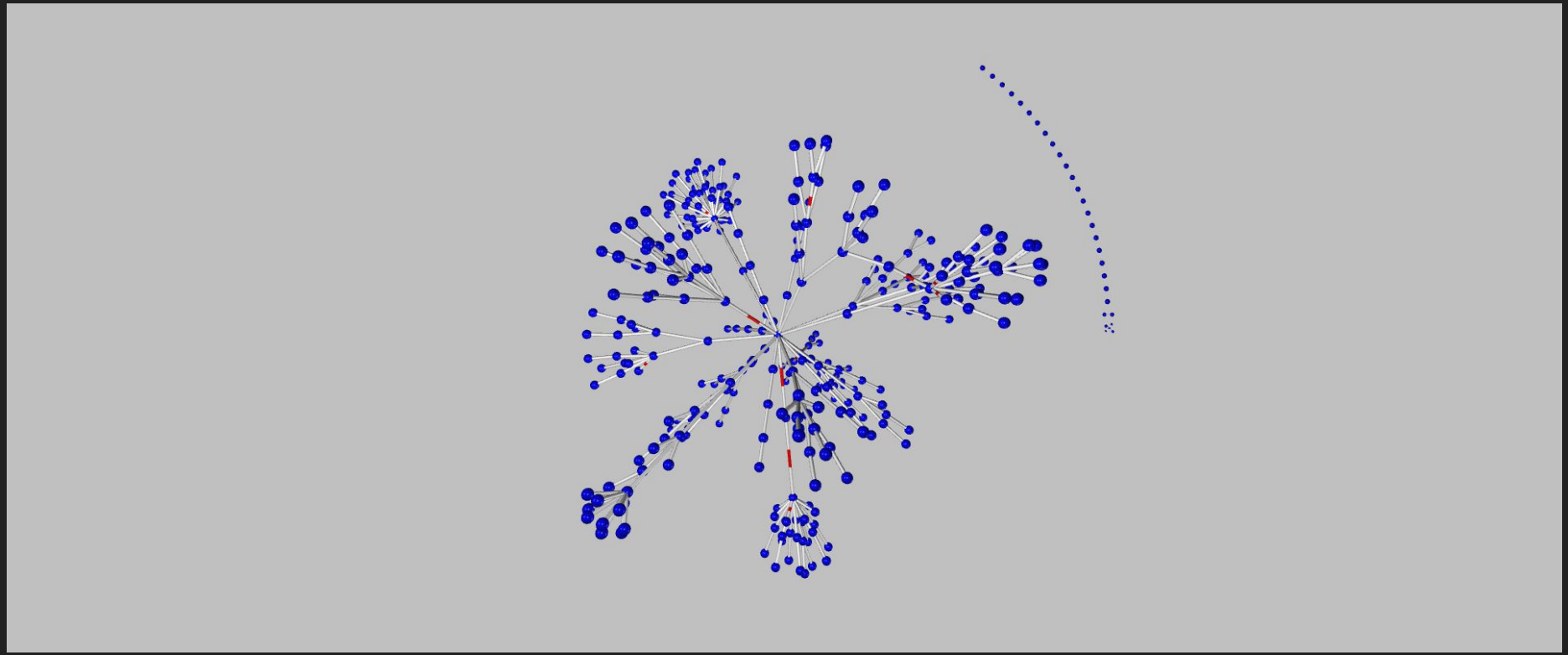
- *Caesalpinia lutea*
- *Poinciana pulcherrima* L.

Taxonomic Classification: Visualization 1 (Gephi)

- Summary:
  - Nodes: 363
  - Edges: 357
- Layout Algorithms:
  - Fruchterman Reingold
- Attributes
  - Color: Taxon Level
  - Diameter: Page Rank
- [Interactive Demo]



Taxonomic Classification: Visualization 2 (Graphia)



Taxonomic Classification: Demo and Review

- Run demo from cs-edwards.github.io (temp hosted)
- [backup] Run Live Server from VS Code (Screen Share)

Data from Visualization:

- Top 3 tree families:
  - **Fabaceae (Legumes)**
  - **Malvaceae (Mallow)**
  - **Arecaceae (Palm)**

Final Project Repo:

- GitHub
  https://github.com/CS-Edwards/oahu_trees