Finding the Best Family Hiking Trail - Columbia River Gorge Area

Team 10:

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Project 3

Introduction

Our project is built around a simple but meaningful idea: encouraging families and individuals to spend more time outdoors, walking and exploring nature. With so many of us glued to screens and stuck indoors, we wanted to inspire people to embrace the benefits of fresh air and physical activity—something that's not only great for our health but also sets a positive example for children to follow.

To make this possible, we decided to analyze hiking trail data of Columbia River Gorge Area to highlight family friendly trails and promote outdoor adventures.

By shining a spotlight on trails and providing accessible information, we hope to encourage more people to take that first step toward healthier, more active lifestyles.

Section | 02

Objectives

Objective 1	Use datasets to find trails near the Columbia River Gorge Region in the Pacific Northwest, that are safe and family friendly.
Objective 2	Merge and clean the datasets found to create a database in MongoDB to store the data for use in dashboard visualizations.
Objective 3	Use different libraries to create multiple visualizations that analyze the location, safety, and family friendly criteria of the trail data.
Objective 4	Create a dashboard with that displays the data visualizations and is easy for users to navigate.

Data Visualization Project Summary

Data Fetching

- https://www.kaggle.com
- https://www.alltrails.com/
- https://unsplash.com
- https://www.oregonhikers.org/
- https://github.com/j-ane/trail-data/tree/master/State%20Trail%20Data

Data Analysis

- **Dataframes with Panda**
- **Database in MongoDB**

Data Visualization

- **Dashboard with CSS and HTML**
- **Data Visualizations with Python and Javascript**

Data Cleaning and Data Analysis

Challenges Encountered

However, the journey wasn't without its challenges. When we first began working with the data, we quickly realized it was incomplete and messy—full of missing values and inconsistencies. It took nearly a week of dedicated effort to clean and prepare the data for analysis, ensuring the results we present are accurate and reliable.

And yet, we kept coming back to this issue, as even the coordinates we found turned out to be incorrect

Data Sources:

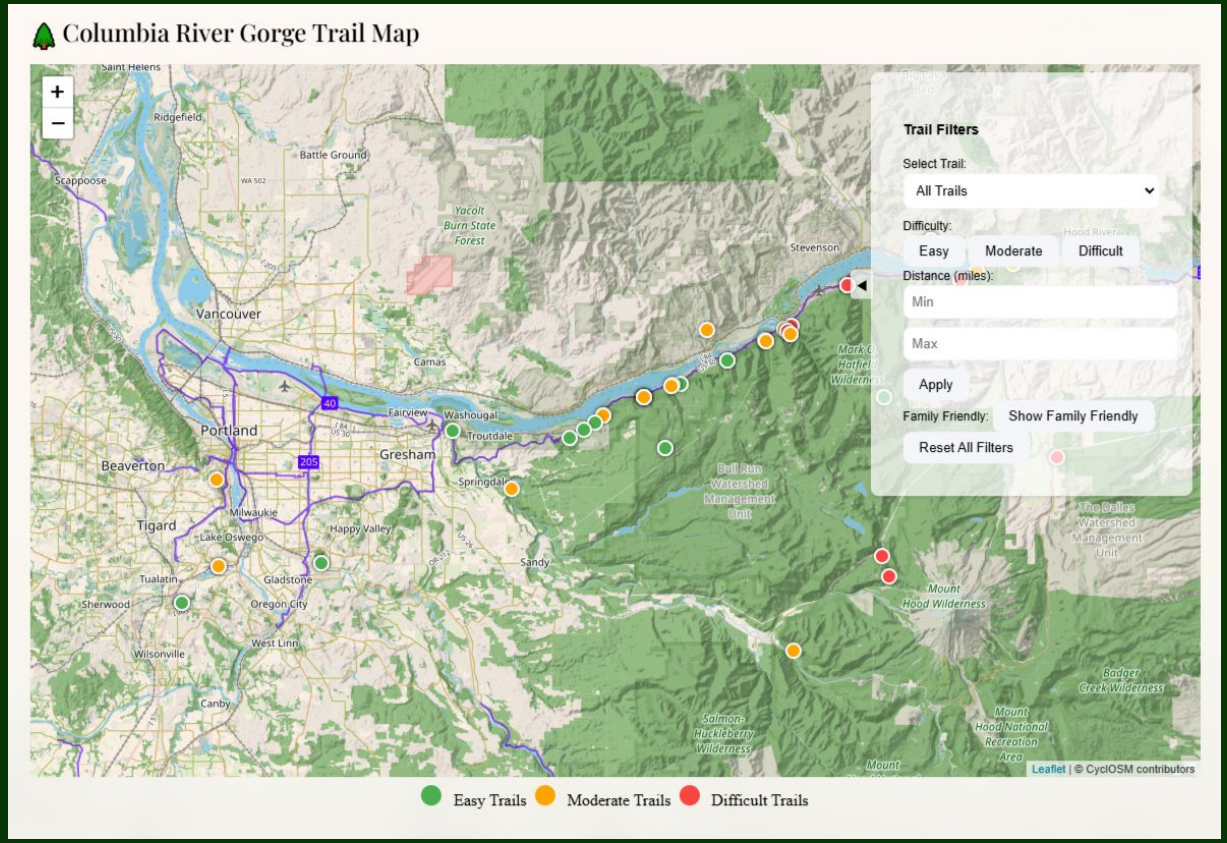
The dataset consists of information on various hiking trails in the Columbia River Gorge:

- **Trail Distance**
- **High Point**
- **Elevation Gain**
- **Hazards** (rattlesnakes, ticks, poison ivy, etc.)
- **Difficulty Level** (easy, moderate, difficult)
- **Trail Type** (e.g., loop, out-and-back)

Visualization 1

Where are the different trails located?

Location Mapping



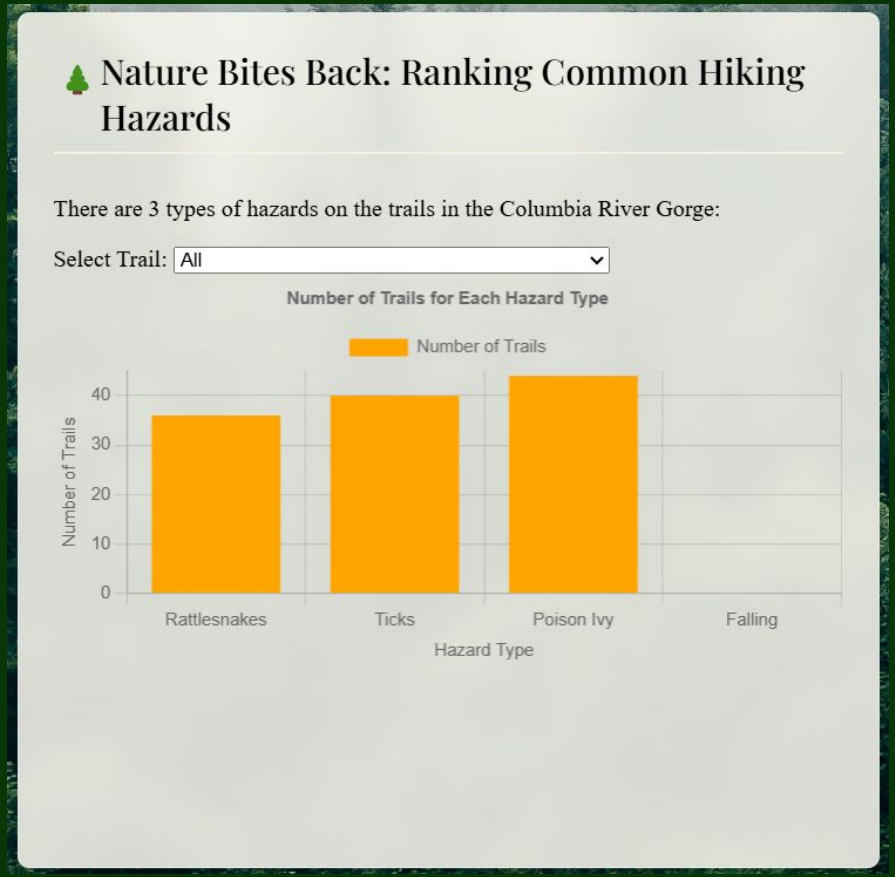
- Trail map with topo overlay showing landmarks and viewpoints
- Color-coded markers with popups showing distance, difficulty, elevation, and family friendly status
- Filter system for trail name, difficulty, distance, and family-friendly options

Visualization 2

What types of trail hazards are found each trail?

Hazards Graph

- Pandas used to clean and merge datasets with Hazards and Trail information.
- Chart.js used to create the bar chart based on number of trails for each hazard category.
- Filter created to select specific trails and update graph based on hazards for each trail.



Visualization 3

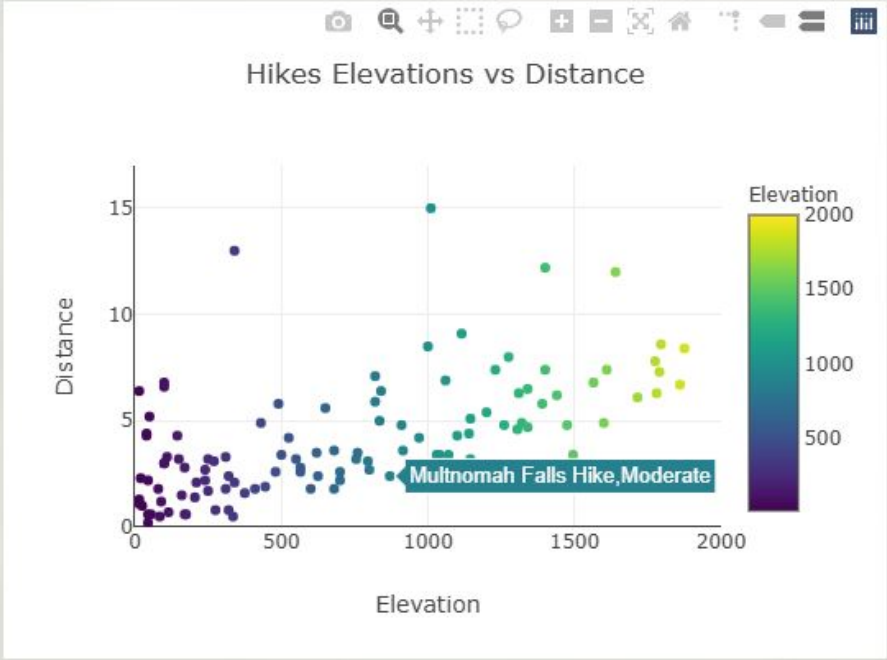
What is relationship between the distance and elevation for each trail?

Distance Graph

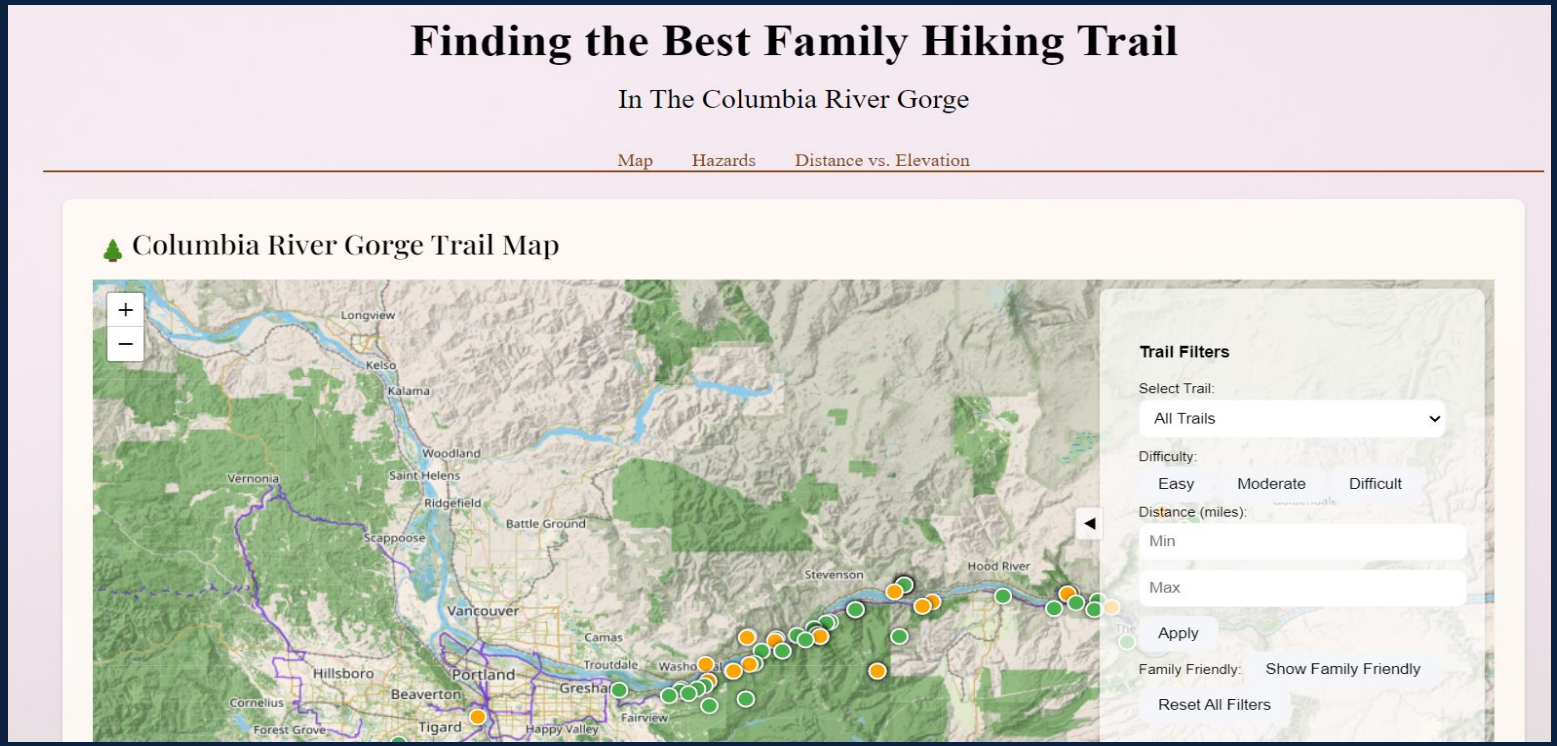
- Merged Clean dataset
- Papa.parse library
- Scatterplot Javascript

Climbing the Data: The Relationship Between Elevation and Distance

How does the elevation of a trail relate to its distance? Let's find out!



Dashboard


Finding the Best Family Hiking Trail
In The Columbia River Gorge
Map
Hazards
Distance vs. Elevation
Columbia River Gorge Trail Map
Longview
Kelso
Kalama
Woodland
Saint Helens
Vernonia
Ridgefield
Battle Ground
Scappoose
Vancouver
Camas
Troutdale
Portland
Hillsboro
Beaverton
Cornelius
Forest Grove
Tigard
Happy Valley
Fairview
Stevenson
Hood River
Trail Filters
Select Trail:
All Trails
Difficulty:
Easy
Moderate
Difficult
Distance (miles):
Min
Max
Apply
Family Friendly:
Show Family Friendly
Reset All Filters

Analysis Summary

Through the data gathered, our team has worked to filter the data and focus on family friendly trails. Our team defined that family friendly trail should be defined by hazards on the trails, distance and elevation gain.

We have development a topo overlook where hikes are located and indicating the difficulty of the hike by color. The topo map also include a dashboard where family can go an filter through hikes by distance and difficulty. A bar chart was created to demonstrating the potential hazards a trail may have, such as rattlesnakes, ticks, poison ivy and falling. A scatter was created to demonstrated the distance and elevation of each hike.

Our project overall, gives users and families many methods to find the perfect trail that best suits their family.

Questions?


Thank
You