

Exploring shark attacks

DEEPWAY

INTERNATIONAL DIVING
BUSINESS CASE STUDY

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PROBLEM AND HYPOTHESIS

H1: Shark attacks are more frequent near reefs and coastlines compared to open waters.

H2: Shark attacks are more common in regions like Australia, the USA, and South Africa due to environmental factors and human activity.

Problem Statement:

Shark attack risks vary with environmental factors, human activity, and seasonality, but the main influences remain uncertain.

This lack of clarity affects safety, tourism, and product strategies in high-risk areas.

H3: Snorkeling and swimming pose a higher risk of shark encounters than other water sports.

H4: Shark attack frequency peaks in summer and during high tourist seasons

H5: Shark attacks are mostly non-fatal, as sharks bite out of curiosity rather than aggression, usually causing injuries rather than deaths.

TECHNIQUES OR METHODS USED

COLUMN REMOVAL & FORMATTING

STRING STANDARDIZATION

HANDLING MISSING VALUES

MANUAL MAPPING

CATEGORIZATION AND GROUPING

DATE AND TIME PARSING

NUMERIC CONVERSION

DUPLICATE REMOVAL

DATA WRANGLING AND CLEANING

1. Missing Data:

- Dropped rows with missing values in critical fields.
- Filled missing values in other columns

2. Irrelevant Columns:

- Dropped irrelevant columns

3. Formatting Issues:

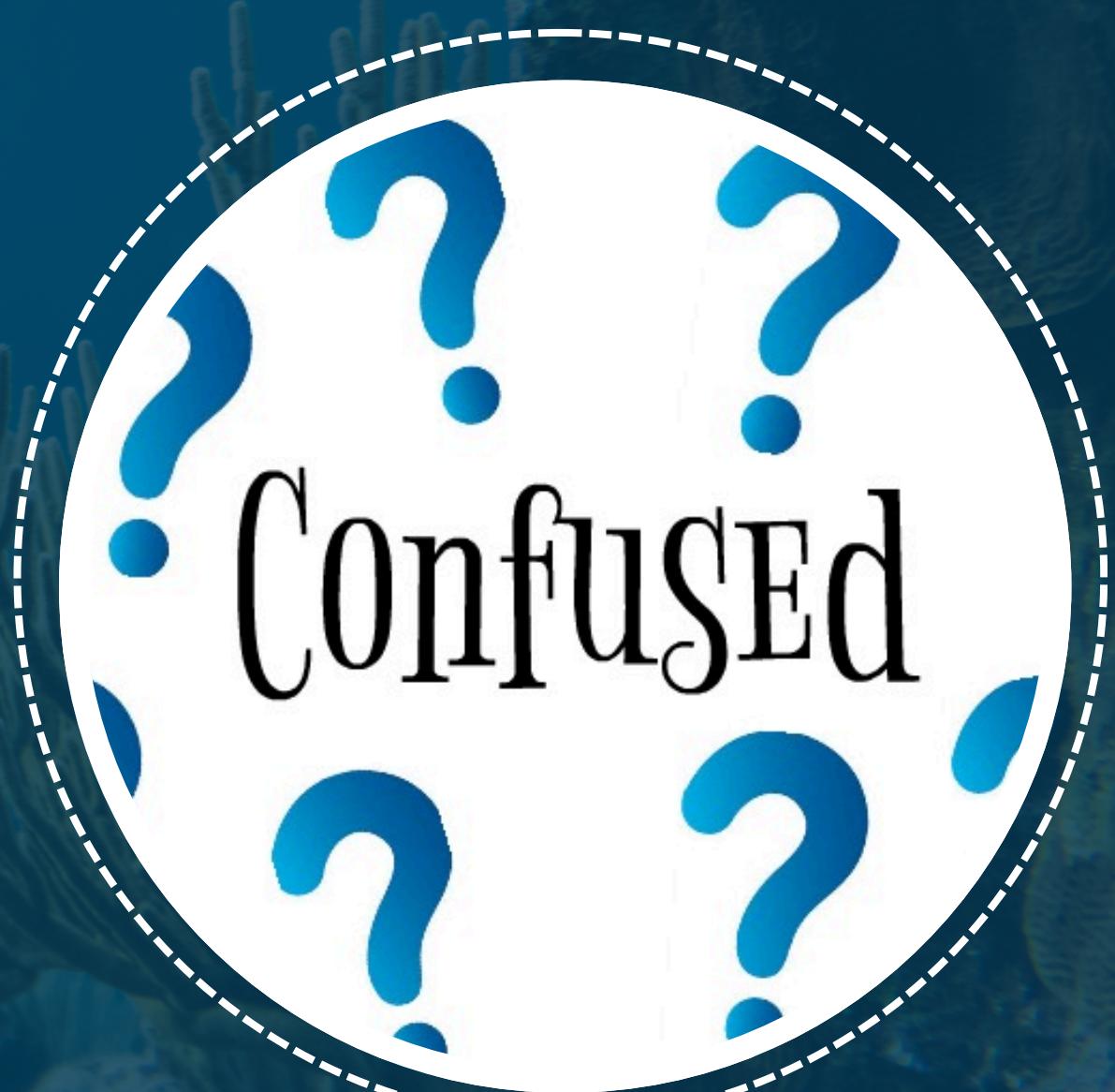
- Cleaned and converted Date and Time to standard formats.
- Standardized text fields

4. Unstructured Categories:

- Grouped them into simplified categories using custom functions.

5. Inconsistent Country/State Names:

- Used mapping dictionaries to standardize names.



EXPLORATORY DATA ANALYSIS

METHODS

DESCRIPTIVE STATISTICS AND AGGREGATION:

`value_counts()` and `groupby()`

DATA VISUALIZATION:

`plt.pie`; `sns.barplot`; `sns.lineplot`

EXPLORATORY DATA ANALYSIS

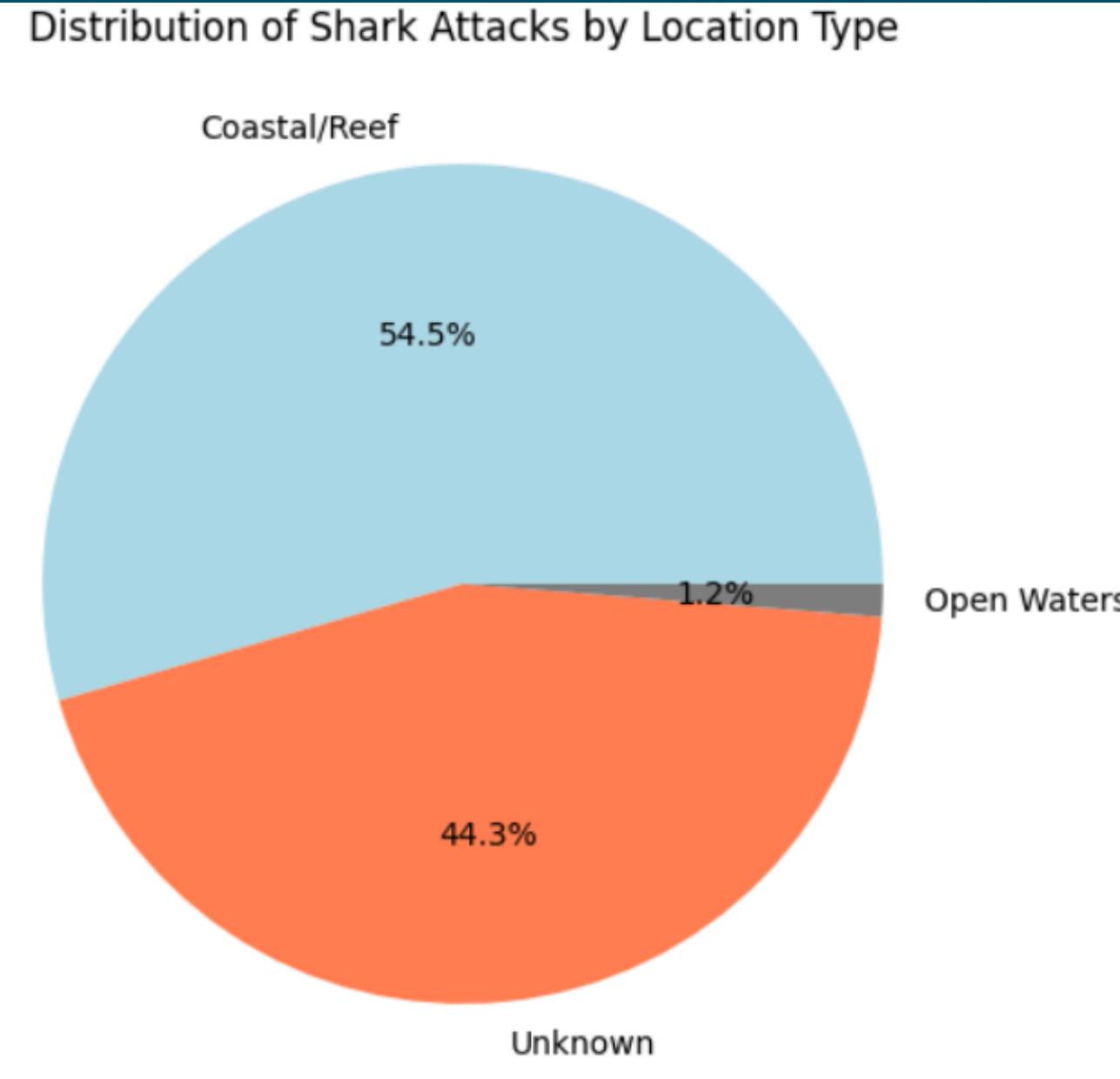


FIG.1

FIG.2

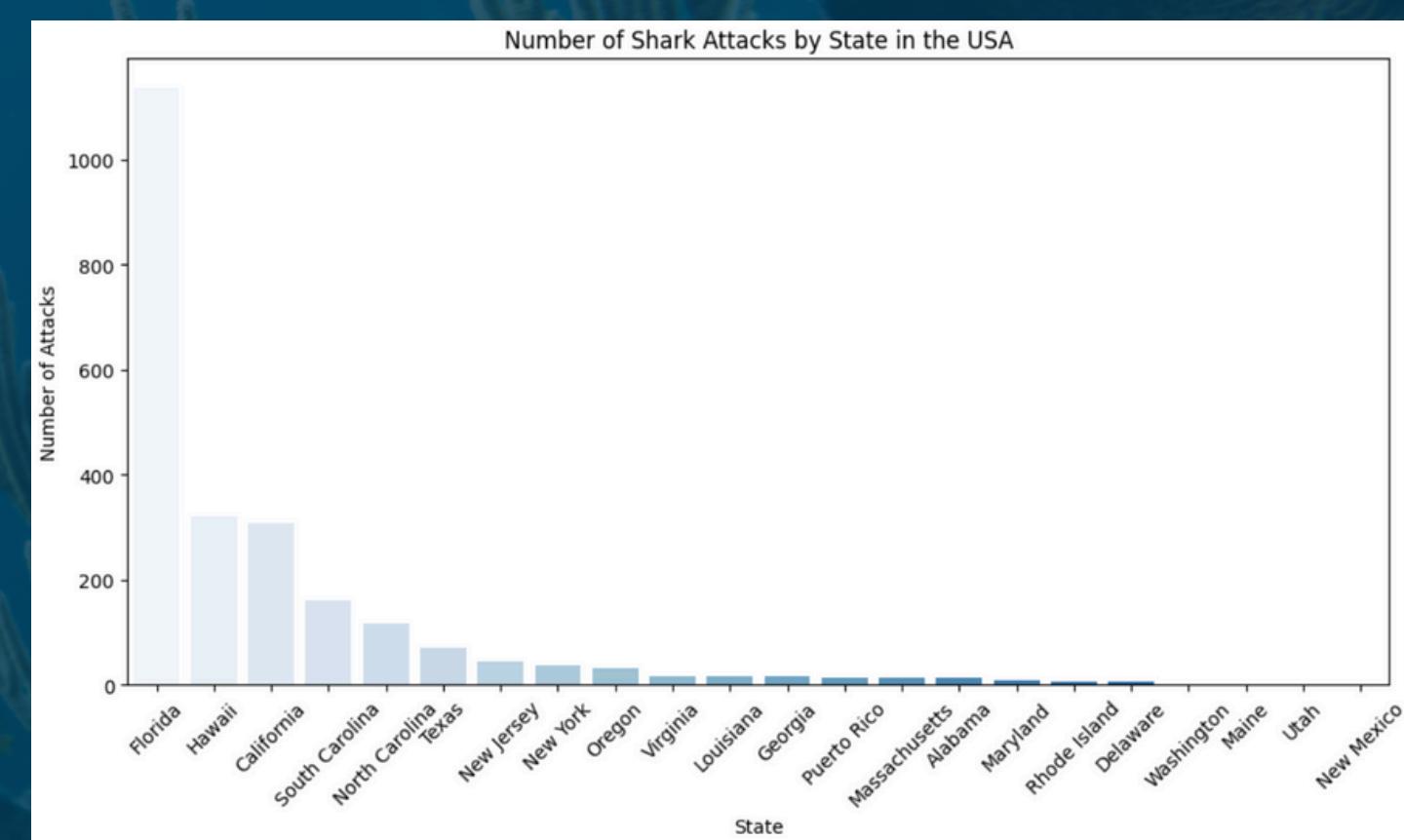
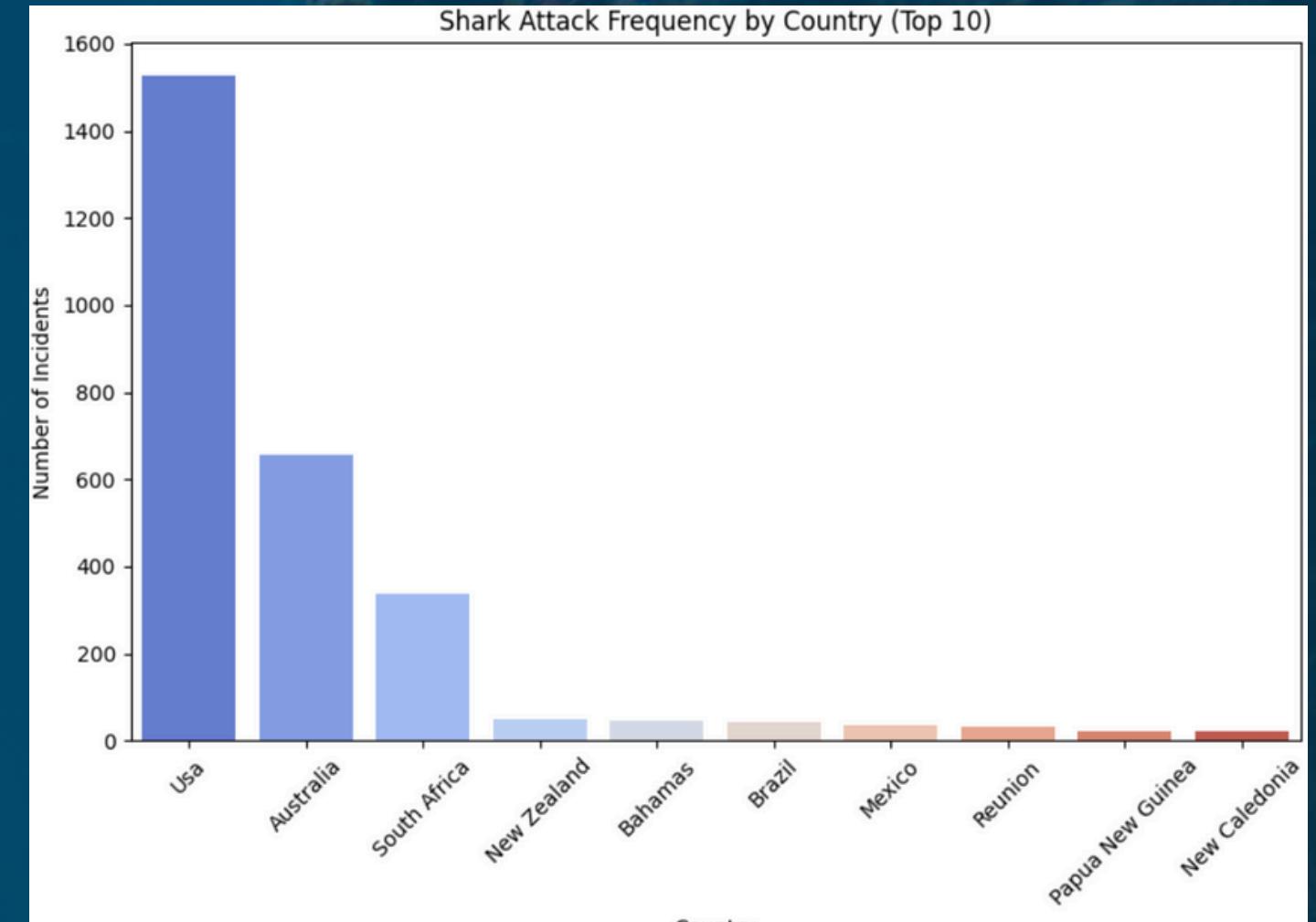


FIG.3

EXPLORATORY DATA ANALYSIS

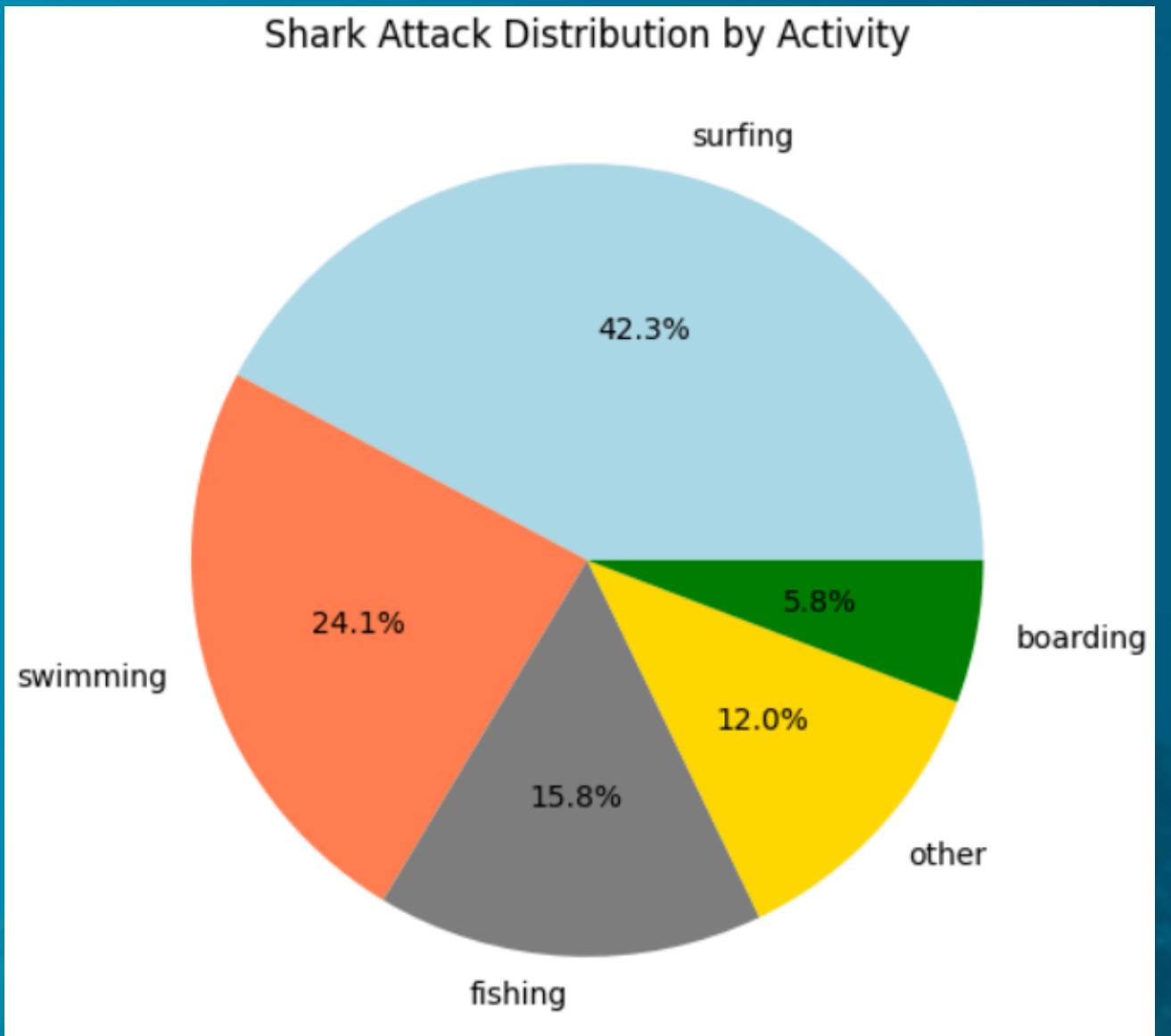


FIG.4

FIG.5

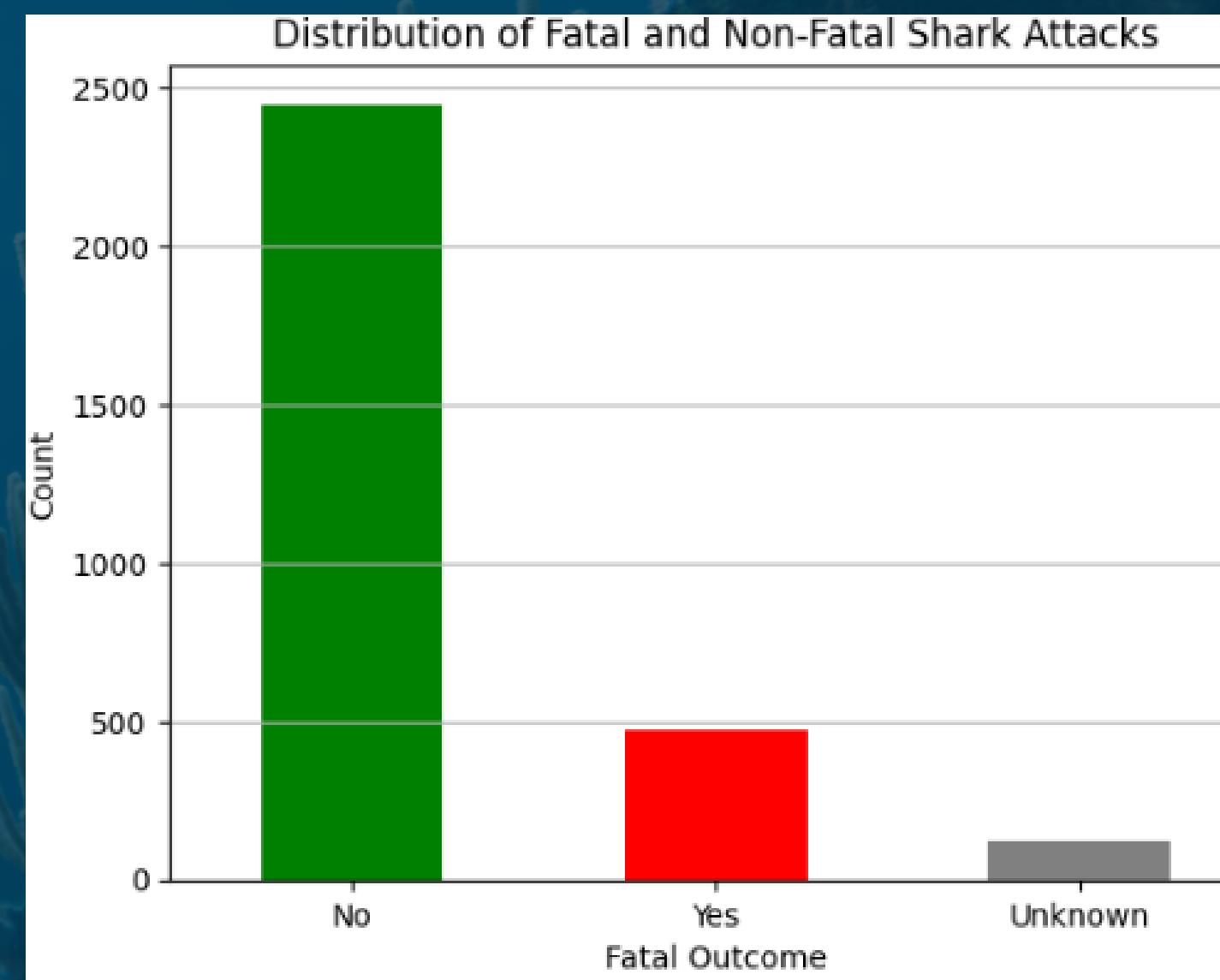
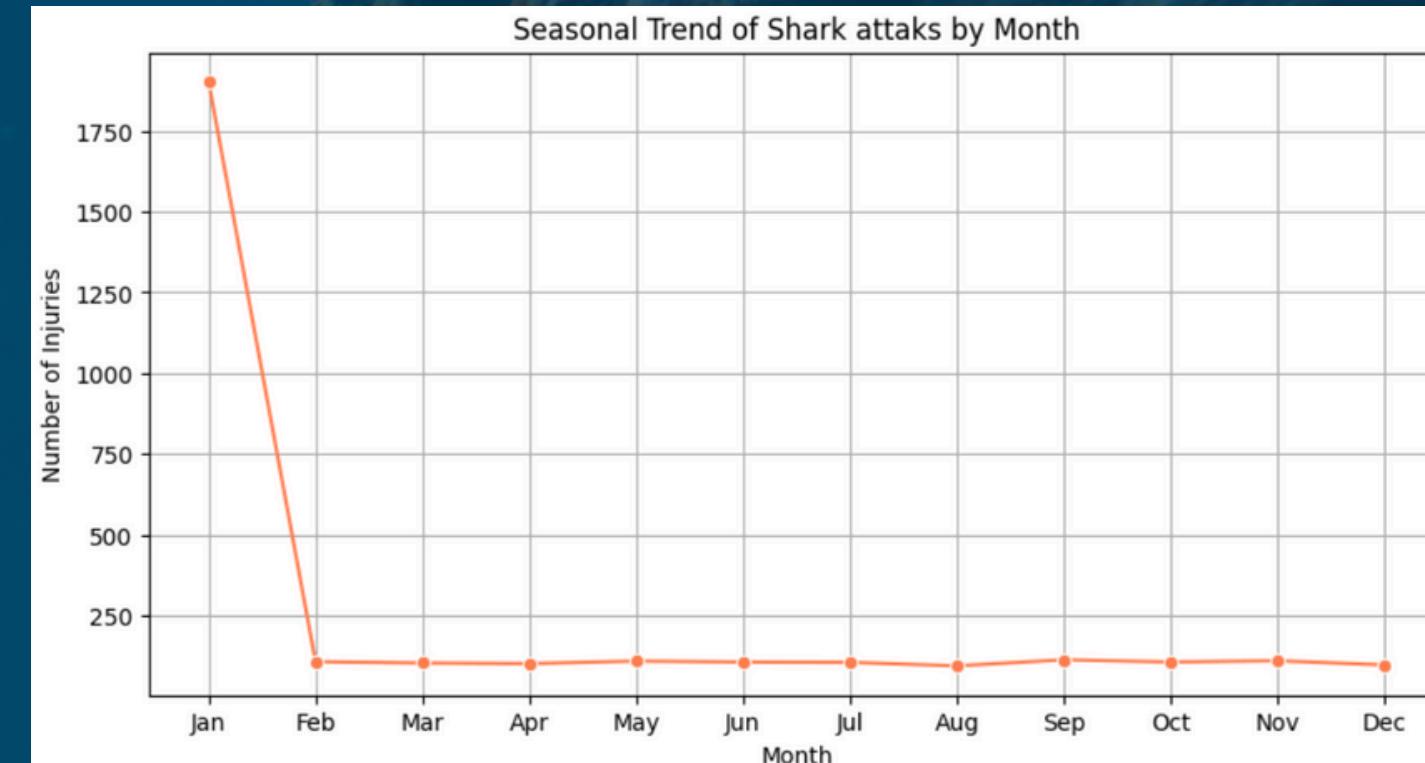


FIG.6

MAJOR OBSTACLE

MANAGING THE LARGE VOLUME OF DATA

WORKING WITH THE CODING

UNVALID VALUES

WHAT WE LEARNED

HOW TO USE DATA VISUALIZATION AND SPECIFIC CODING TOOLS

FOCUSING ON PATTERNS, QUESTIONING ANOMALIES, AND MAKING DATA-DRIVEN DECISIONS

TEAM WORK

CONCLUSION & INSIGHTS

Hypothesis 1 (Coastal/Reef vs. Open Waters)

Supported

Hypothesis 2 (Regional Attack Rates)

Supported

Hypothesis 3 (Activity Influence)

Supported

Hypothesis 4 (Seasonality & Trends)

Partially Supported

Hypothesis 5 (Fatal vs. Non-Fatal Outcomes)

Supported

Surprising Insights:

January anomaly (1,903 cases) :
Unexpected spike suggests possible data
inaccuracies or recording issues.

IMPLICATIONS OF FINDINGS

Tourism & Public Safety:

- Coastal regions can improve safety awareness and risk communication to reduce fear-driven tourism declines.
- Better classification methods (such as geolocation verification) could improve attack records.

Marine Conservation & Shark Behavior Studies:

- Understanding species behavior in different regions could enhance coexistence strategies.
- Shark deterrent innovations (e.g., surfboard sensors) could be explored based on high-risk activities.

Further Research:

Investigate seasonal influences more deeply to clarify why summer peaks weren't significant

THANK YOU

A vibrant underwater scene featuring a coral reef. Various types of coral, including brain coral and立管珊瑚, are visible. Several small, colorful fish, such as yellowtail fusilier and blue tang, are swimming around the reef. The water is a clear, translucent blue.

The background of the slide is a photograph of an underwater coral reef with several small fish swimming around. The main text 'THANK YOU' is overlaid in large, white, sans-serif letters. Below the main text, there is a list of names in smaller white letters.

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