

Plan:

1. Introduce Analytical Approaches
2. Discuss in Context of COGS 108 Project

Approaches to Analysis

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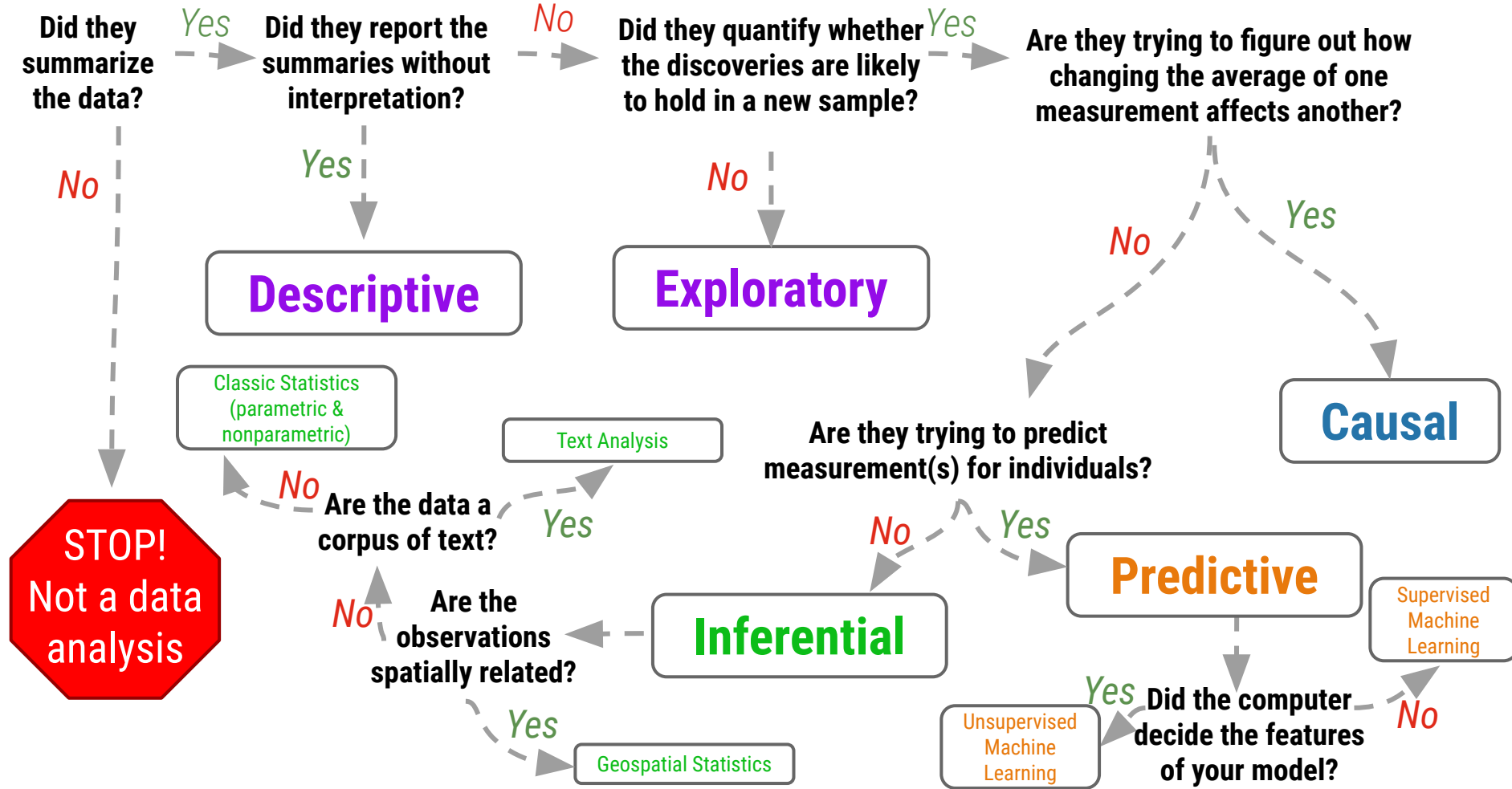


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*“Data science is the process of formulating a quantitative question that can be answered with data, collecting and cleaning the data, **analyzing the data**, and communicating the answer to the question to a relevant audience.”*

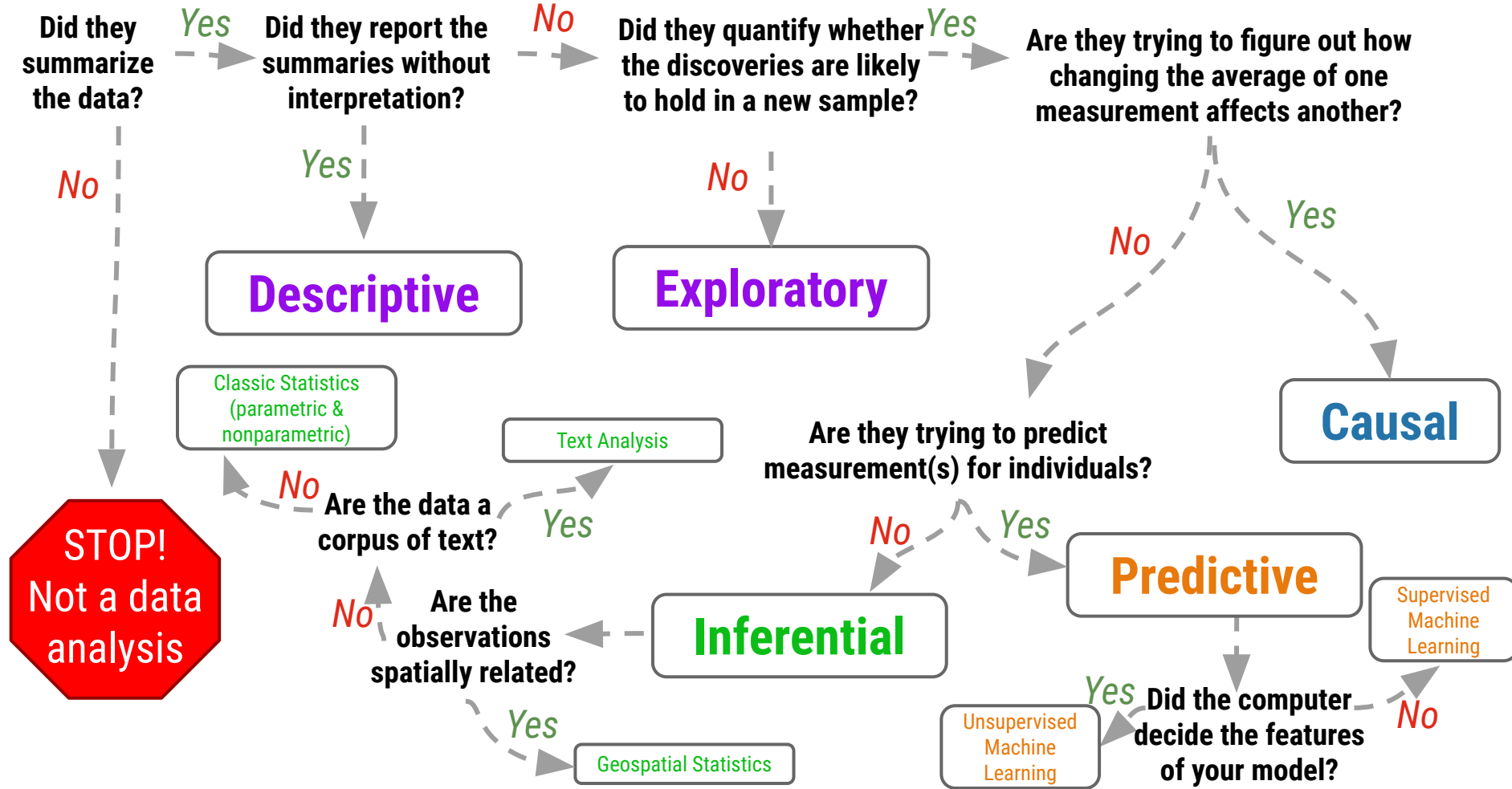


To do this, you have to look at, describe, and explore the data



Summary: Analytical Approaches

1. **Descriptive** (and **Exploratory**) Data Analysis are the first step(s)
2. **Inference** establishes relationships
 - a. Classic Statistics
 - b. Geospatial Analysis
 - c. Text Analysis
3. Machine Learning is for **prediction**
 - a. Supervised
 - b. Unsupervised
4. Experiments best way to establish **causality**



Exploring Analyses

General question: What impacts politics in America?

Data Science question: Is there a relationship between the sentiment of political words in South Park and America's presidential approval rating?

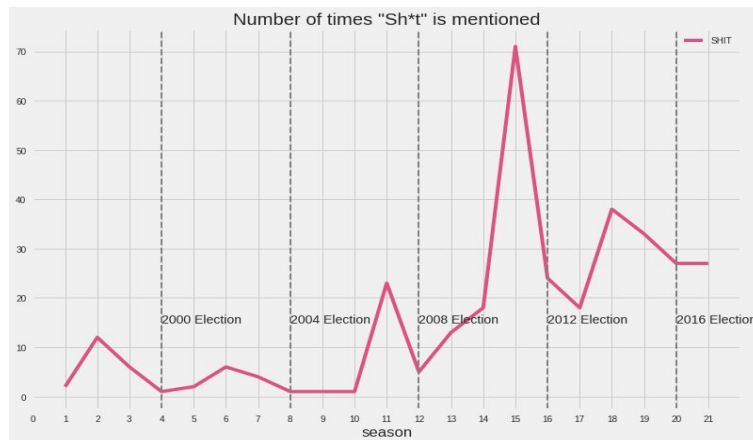
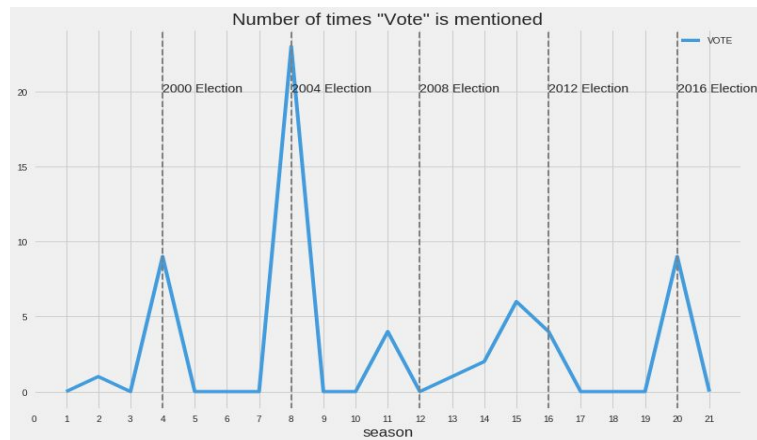
Descriptive

Exploratory

Inferential

Text Analysis

Classic Statistics
(parametric &
nonparametric)



General question: What gets too much attention in the news?

Data Science Question: Is there a relationship over time between cause of death terms in the *NYT*, The Guardian, and Google trends data relative to data from the CDC?

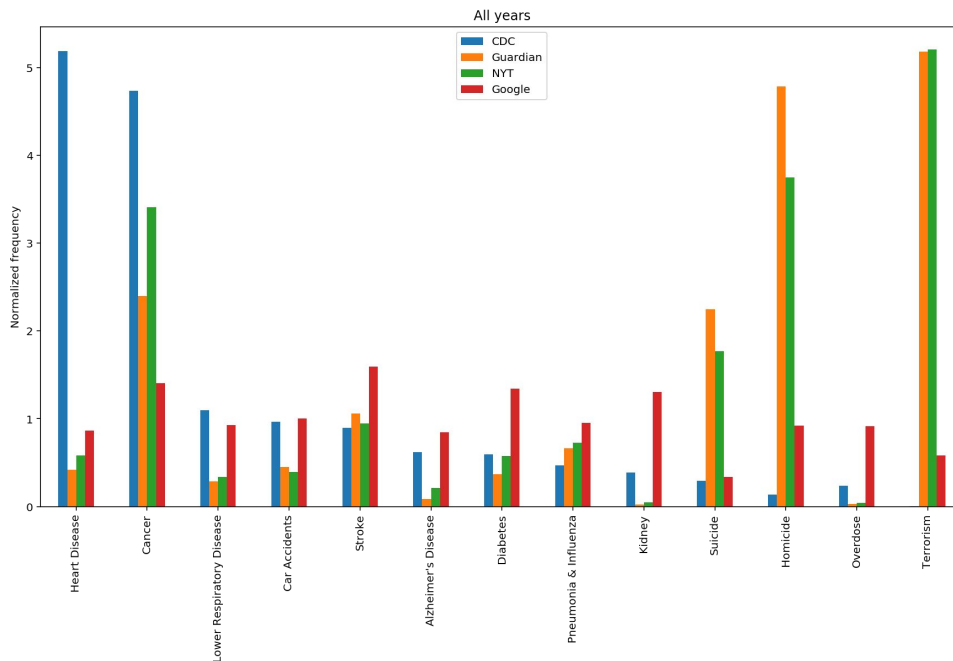
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Descriptive

Exploratory

Predictive

Classification: Often we seek to assign a label to an item from a discrete set of possibilities.

Can we predict who will win next year's NCAA tournament? The Masters? The Super Bowl? The pennant? A game?

Can we predict the genre of a given movie (comedy, drama, or animation?) from just its script?

Descriptive

Exploratory

Predictive

Regression: A way to forecast a given numerical quantity using other relevant features.

Can we predict someone's weight given other information?

How much snow will the East Coast get this year?

General question: Why isn't police response time always the same?

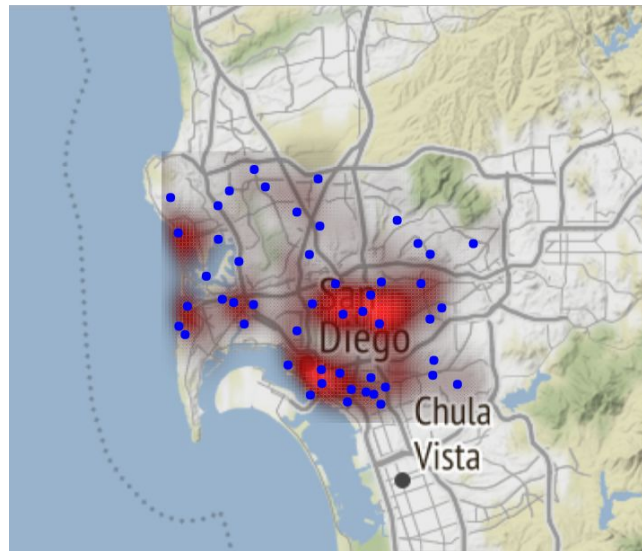
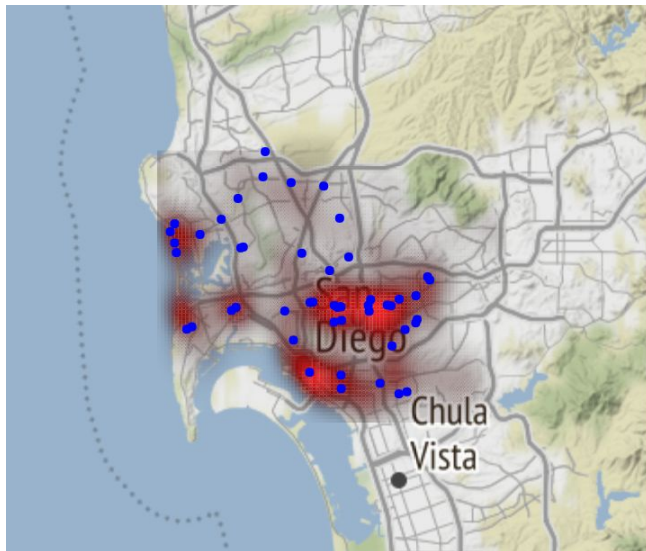
Data Science question: Where should police cars be stationed, accounting for crime levels and time of day, to make police response times equitable throughout San Diego?

Descriptive

Exploratory

Predictive

Inferential



In case of the total drought in California, how many desalination plant projects we need to supply residential use water for population who live in urban areas in California?

Descriptive

Exploratory

Predictive

