Crossroads Classic Analytics Datathon

February 10, 2023

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Introductions

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Actuarial Science / 2011

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Agenda

1. Welcome
2. The Case and The Data
3. BI and Data Science Strategy
4. Questions

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The Case and the Data

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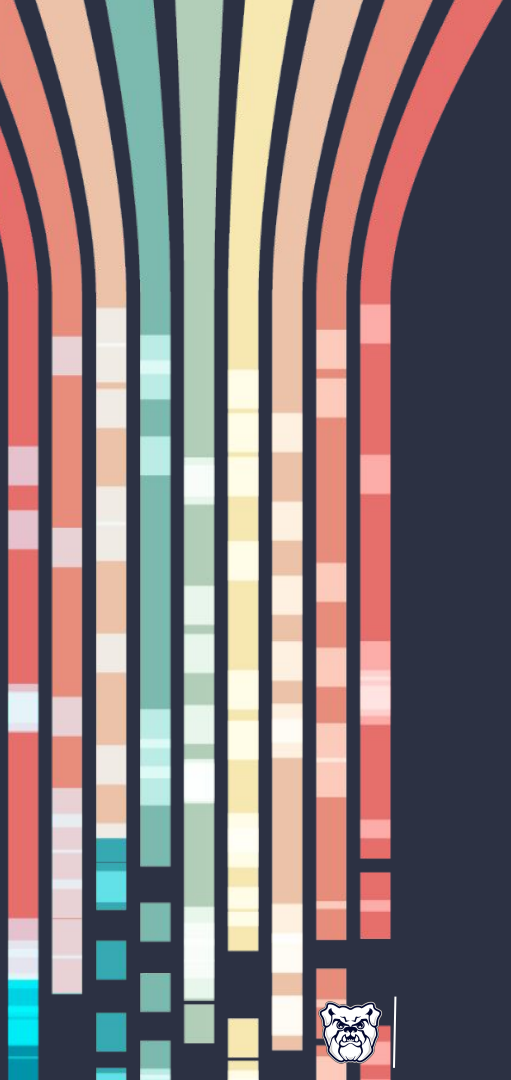

The Problem

Truck sales can be a difficult thing to predict as sale prices are often determined based on a large number of factors, including market conditions, truck characteristics, and economic factors like competition, supply, and demand. Much of the time, the process of selling a truck can involve subjective decision making.

Atrium is interested in being able to automate truck pricing based on a variety of factors, and provide their salespeople with a better starting point in sales negotiations.

Output from this analysis could be used in several ways:

1) Inform **Top Factors** that determine the price of a truck
2) Forecast

Who is our Business?

Atrium is interested in being able to automate truck pricing based on a variety of factors, and provide their salespeople with a better starting point in sales negotiations.

Business focus:

- Build dashboards that are focused on the Sales Rep and making their life easier
- Build predictive models that provide insights for the Sales Rep to better negotiate based on data set
- Forecast future sales

What is our Data

- **Provided Data:**
  - Atrium has provided their truck data to you
  - There are 35 unique fields you can use to create a predictive model, dashboard, or both
    - Categorical and Numerical

- **The Ask**
  - Your goal is to take the view of what a Salesperson could use and create a sales story for them
  - Forecast future sales

Useable Fields

Types

Categorical

Truck ID	Model
Qtr	Transmission
Quarter	Enguine_Manufacturer
Year	Fuel_Type
Type	Front_Tire_Size
Truck_Manufacturer	Rear_Tire_Size
Region_Nm	Color
Condition	Delivery_Region
Model_Year	Channel
Engine_Type	Delivery_Location

Numerical

Sale_Price	Rear_Axle_Weight
List_Price	front_axle_wt
Pct_of_List	Horsepower
Book_Value	Engine_RPM
Odometer	eng_est_life
Wheelbase_Size	Num_Wheels
Gear_Ratio	Age_Yrs
Num_Axels	

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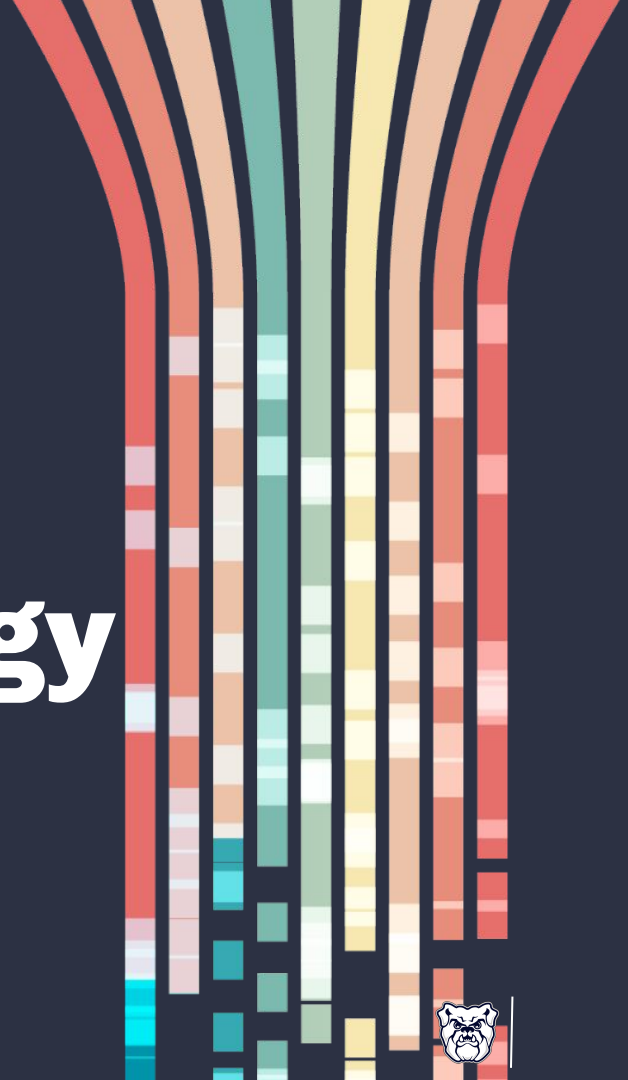
BI and Data Science Strategy



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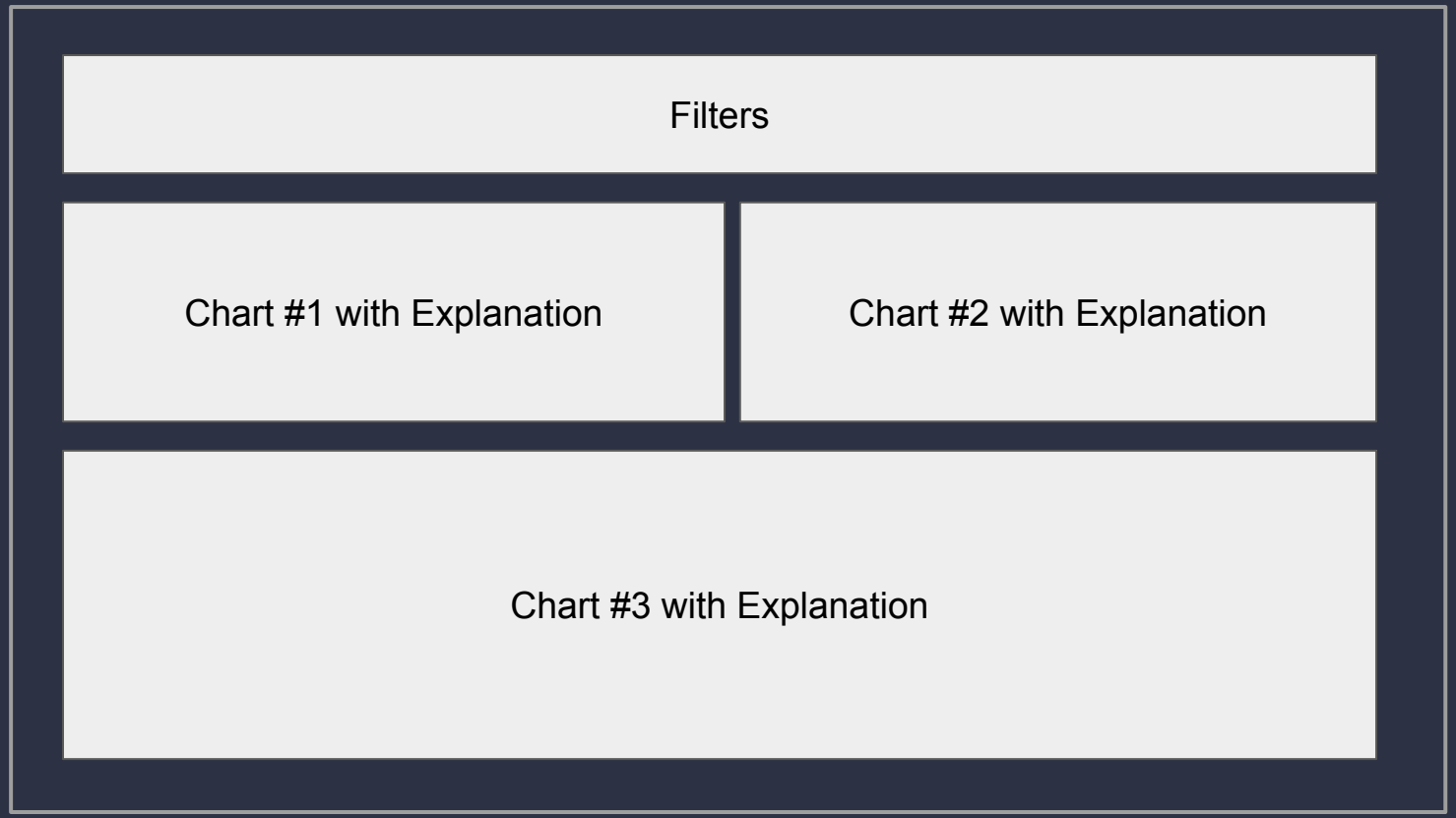
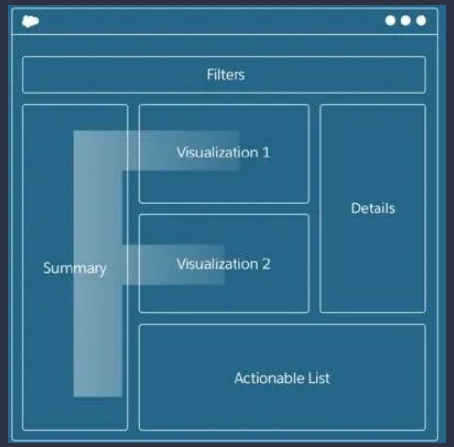
Analytics Deliverables

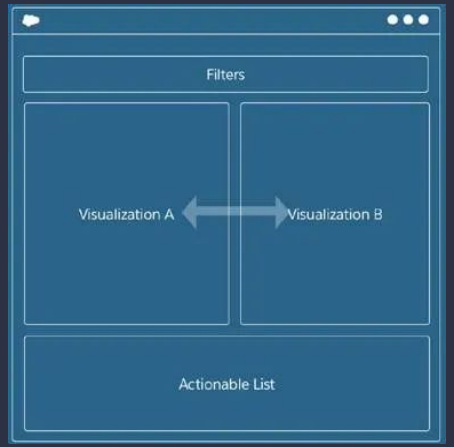
- **Data Story Document**
  - Persona
  - Important Questions and Answers (KPI's)
  - Relevant Data
- **Wireframe Document**
  - Static Visualization of a Dashboard
  - Sketch or Shapes
- **Dashboard (Tableau or PowerBI)**

Wireframe


Filters
Chart #1 with Explanation
Chart #2 with Explanation
Chart #3 with Explanation

Common Design Patterns





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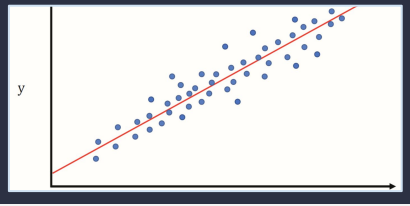
Data Science Deliverables

Typically, Data Science analyses should involve some common components packaged in a written document (either Word, Rmarkdown, Jupyter Notebook, etc.)

- **Exploratory Data Analysis:**
  - Data Quality Assessment
  - Summary statistics
  - Distribution of response variable
  - Correlations of predictors (w/ each other and w/ response)
- **Research Hypotheses**:
  - Why are you investigating a particular feature? What do you expect the impact of one feature to be on the response?
  - Was your hypothesis correct?
- **Model Summary:**
  - After the model is created, document any key insights identified, list the features used, and discuss any considerations/limitations that should be considered in using it.

Model Structures

What can you do with a predictive model on truck data? Here are a few suggestions...



Predict Truck Sales Prices:

- **Predict** a sales price with linear regression (or other methods)
- **Determine** which trucks are predicted to sell for the most?

Identify key factors associated with truck price:

- What are the **most impactful** characteristics of a truck on sales price?
- **Engineer** new variables from existing data to add to predictive models

Identify common types of vehicles that are similar:

- **Cluster** certain types of vehicles
- **Visualize** attributes of trucks
- **Create an app** to assess sensitivity of truck prices to changes

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Rules and Regulations

Round 1
11:30am - Submission of mock up dashboards, models, and game plan

Round 2
4:00pm - Submission of dashboard and predictive model

Round 3
9:00pm - Final presentations

Awards
9:30pm - Awards ceremony and closing remarks

Prizes

Graduate Competition

First place - $2,000
Second place - $1,000

Undergraduate Competition
First place - $1,900
Second place - $750

*****Suprise awards
In the Lacy School of Business effort matters. We have several surprise awards that will given for extraordinary efforts in presentation, innovation, and creative thinking.

Quick Tips

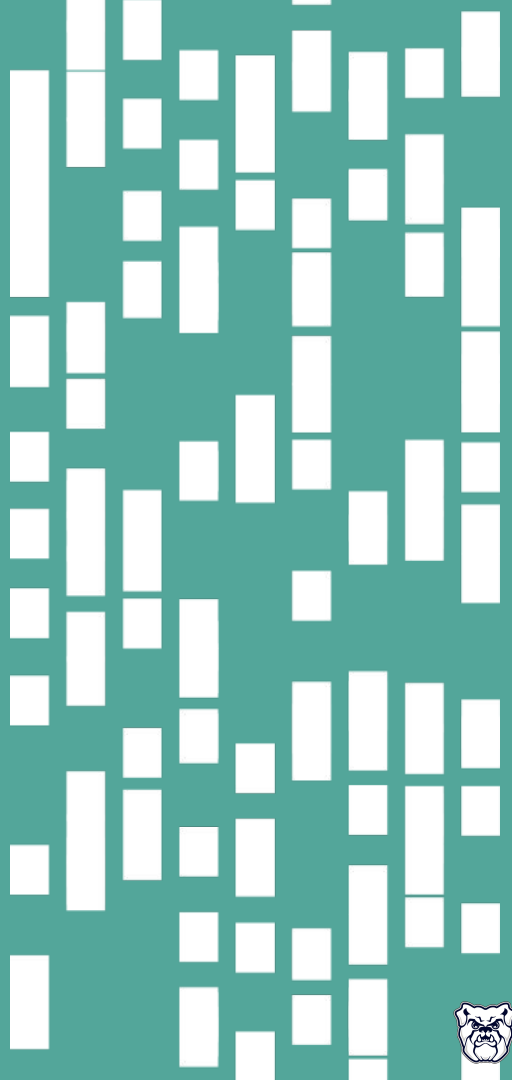
Take your time and ask questions

Lay out your game plan ahead of time

First round will be focused on your game plan - mocks of dashboards/models

HAVE FUN!!!

Questions?



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