



DATA DAY OUT

Deep Dive into Augmented Analytics

Ken Wong

Director, Product Management, Analytics
Tableau

What is **Augmented Analytics**?

Industry Definition: a new approach to automating the Business Analytics process through the use of Machine Learning and Natural Language Processing

Tableau Perspective: Analytic functionality that use AI, ML, and related technologies to help people make better decisions with data

A hand with purple nail polish is pointing at a laptop screen. The background is a blurred image of a laptop screen with a hand pointing at it. The overall image is split into two halves: the left half shows a background of colorful code, and the right half shows a hand pointing at a laptop screen.

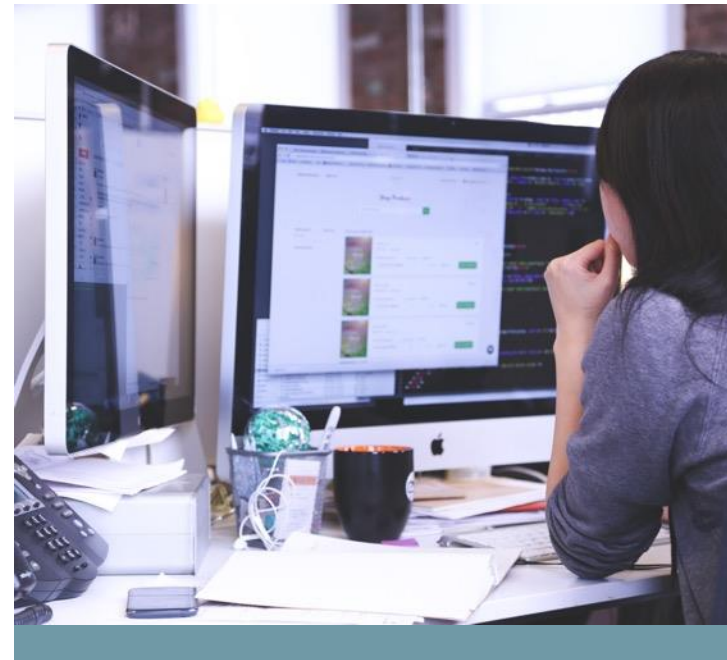
Automation

Augmentation

The Need for Augmentation



Truly **important** business decisions are made by **people**, informed by **data**.



Sound decisions require more than **prediction**, they require **understanding**.



Useful data grows, but **human capacity** remains the same.

The image is a conceptual graphic. In the center, a laptop screen is shown in a dark, semi-transparent style. Inside the screen, a glowing brain is depicted, composed of numerous overlapping, semi-transparent circles in shades of orange, red, and blue. Above the screen, a glowing white profile of a human head is shown, facing right. The background is dark and features a faint, repeating pattern of a laptop keyboard. The overall aesthetic is modern and digital, emphasizing the connection between technology and human thought.

Software should be
designed for deeper thinking

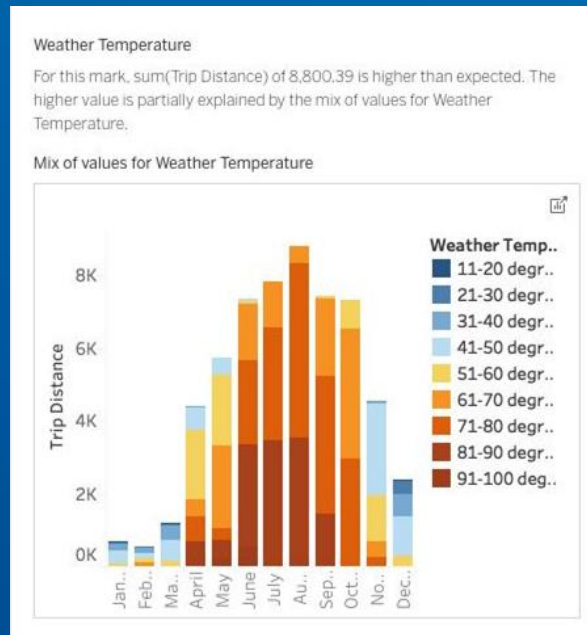
Augmented Analytics 1.0

Features	Tableau
Automated Modelling	Clustering, Forecasting
Recommend Visualization	Show Me TM
Recommend Data	Recommended Tables, Joins, Datasets
Augmented Data Preparation	Fuzzy Groups, Recommend Roles, Transforms
Natural Language Generation	Captions, Narrative Science Extensions
Outlier Labelling	Outliers in Boxplots, Smart Labelling,
Plugin ML Models	R / Python / Matlab

Augmented Analytics 2.0

1. Works on the **data you have**
2. Offers **relevant** suggestions
3. **Accessible** when and where you need
4. **Truthful** to the data
5. Enables interactive and iterative **exploration**

Augmented Analytics @ Tableau



AUTOMATED STATISTICS

Ask about fields in this data source

Or try one of these suggestions:

by Country, bottom Country by earliest Order Date

by Country

sort Country in alphabetical order

top Country by sum of Number of Records

sum of Sales

sum of Sales and sum of Profit as a scatter plot

Sales at least \$0.44

ASK DATA

RECOMMENDATIONS

For You

Find a Person

Why is this recommended?
People with interests similar to yours are looking at this.

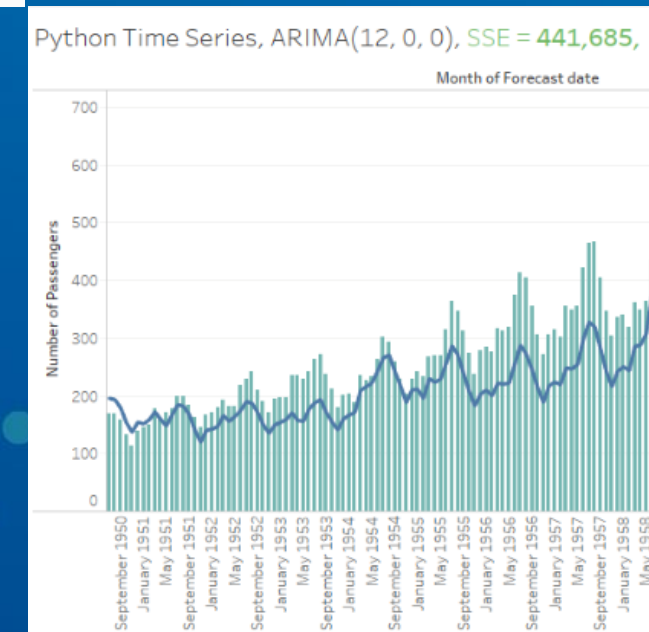
[Iyala Ivanny](#), Yogesh Sood, Lu Yu

Workbook Feature Team Viz

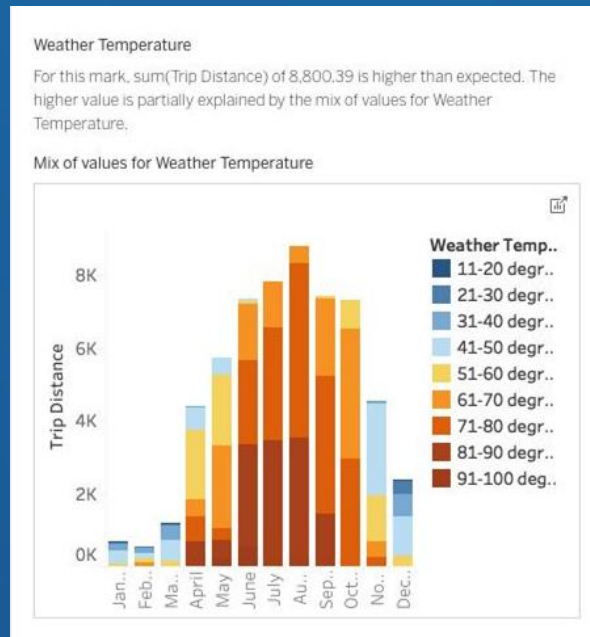
Owner Maria Freeman

Modified Jul 1, 2019, 10:50 AM

EXTENSIBLE ADVANCED ANALYTICS



Augmented Analytics @ Tableau



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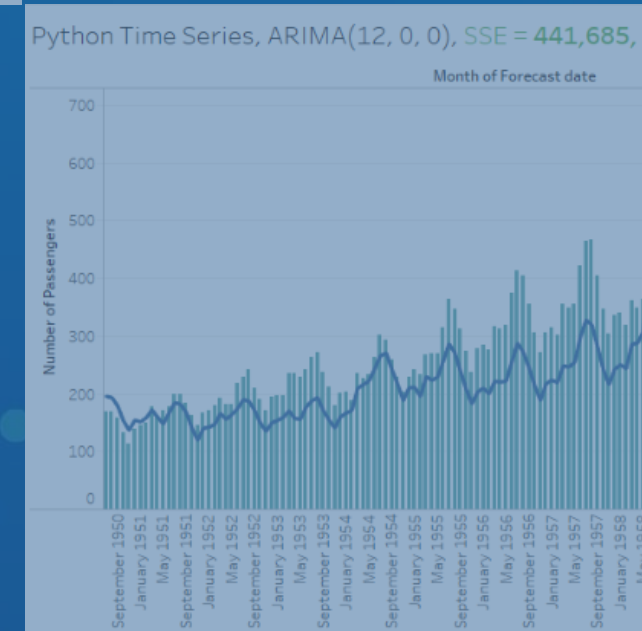
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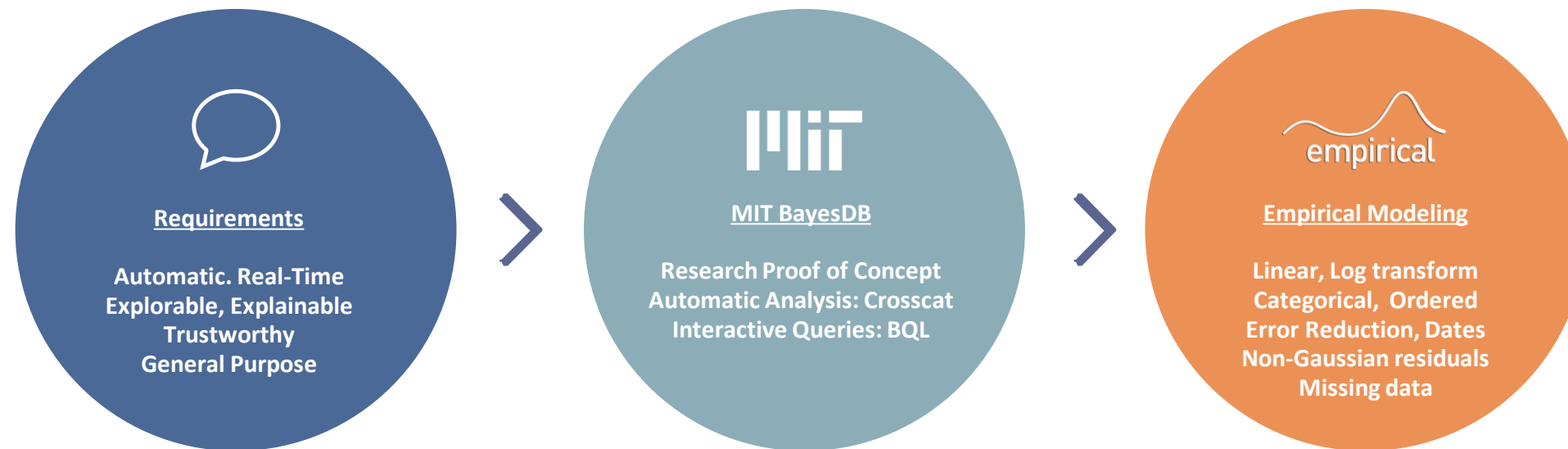
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Empirical Systems Origins: *Automatic, Real-Time, Explainable, Queryable*



Key Innovations:

- Automate the analysis a trained statistician would do
- Make that analysis queryable by tools and API

Explain Data—from “What” to “Why”

Relevant

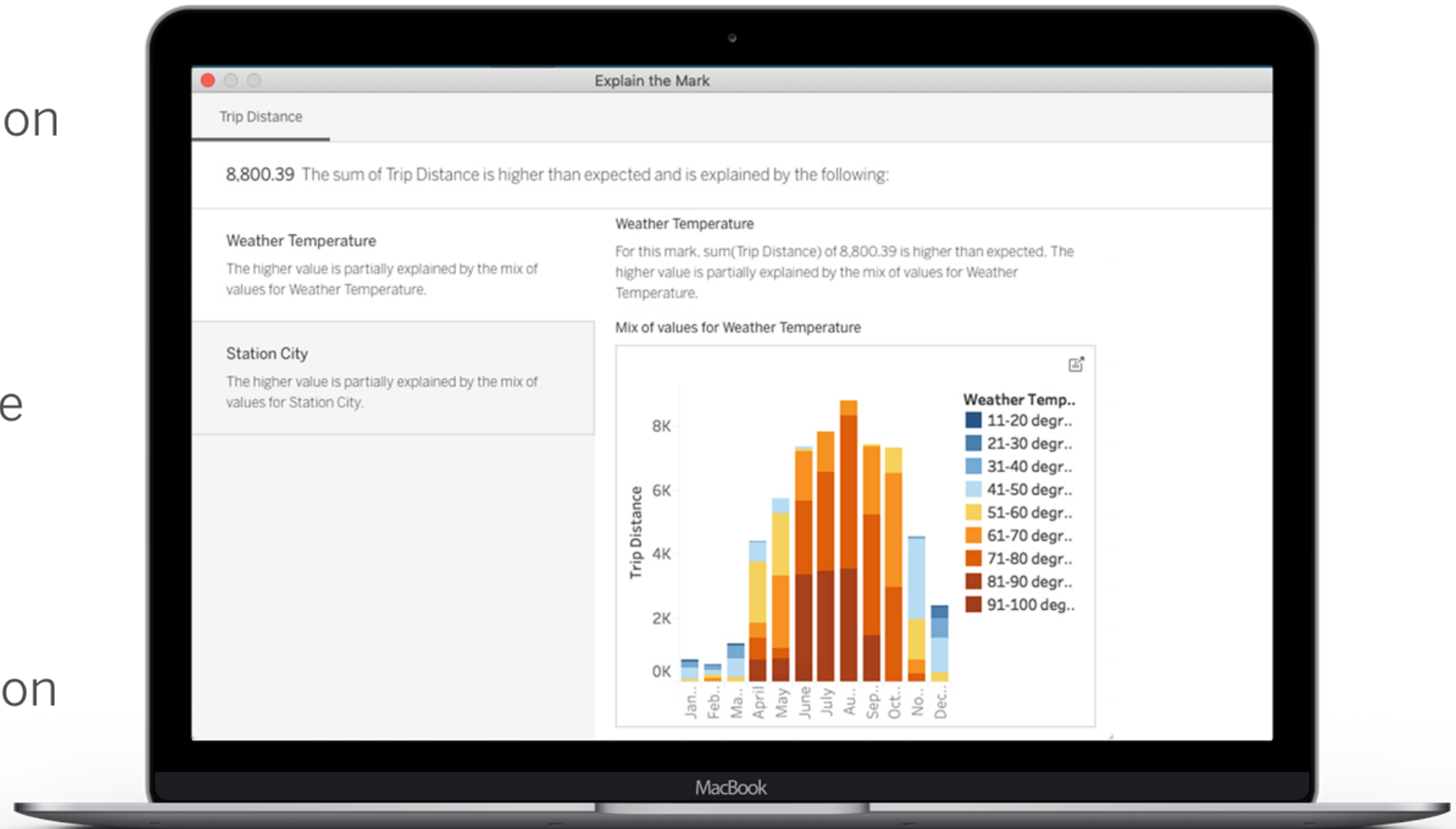
Pertinent to you and the question on your mind

Truthful

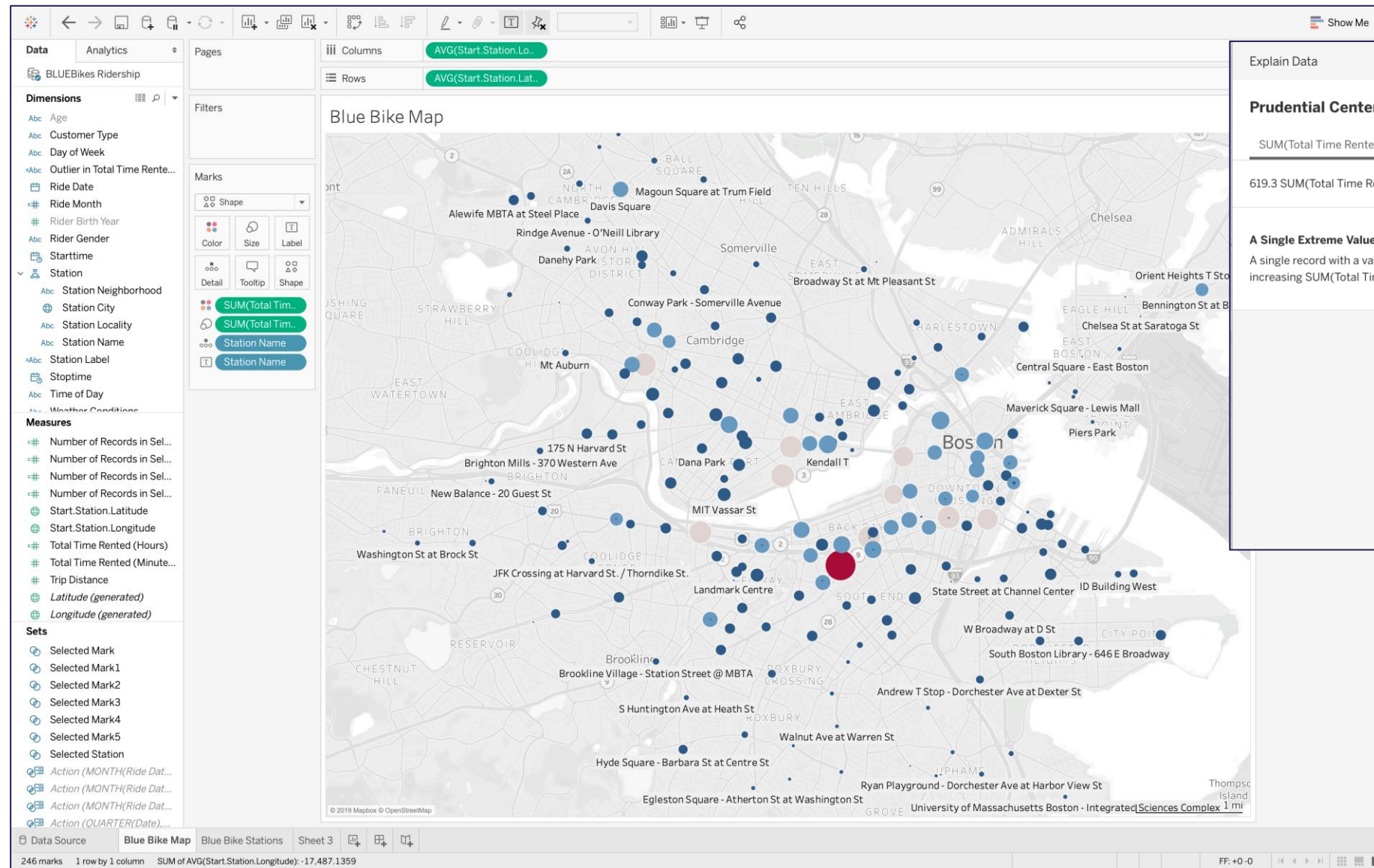
Inspires and raises the appropriate confidence and questions

Engaging

Enables and encourages exploration



Explain Data Demonstration



Explain Data

Prudential Center - Belvedere St

SUM(Total Time Rented (Hours))

619.3 SUM(Total Time Rented (Hours)) is higher than expected. Possible explanations:

A Single Extreme Value
A single record with a value of 463.9 is increasing SUM(Total Time Rented (Hours)).

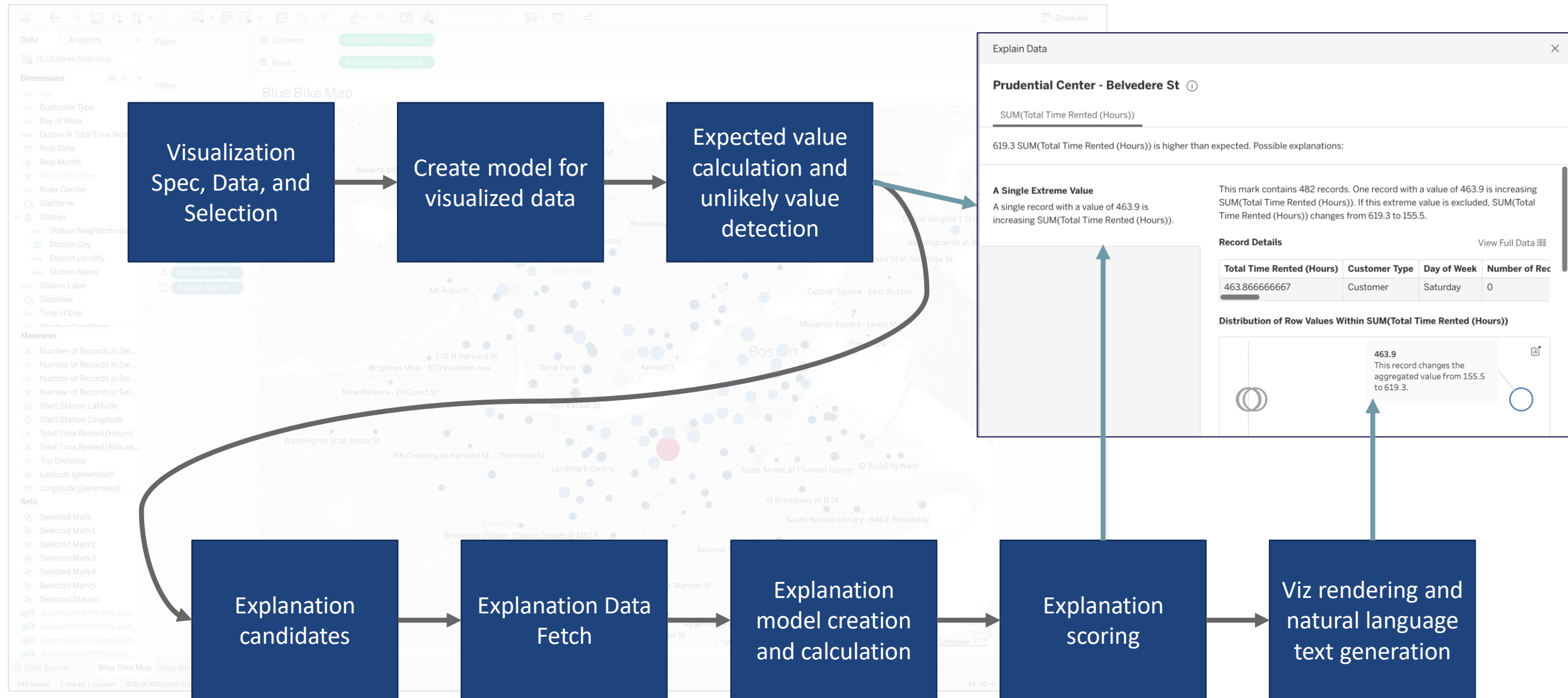
This mark contains 482 records. One record with a value of 463.9 is increasing SUM(Total Time Rented (Hours)). If this extreme value is excluded, SUM(Total Time Rented (Hours)) changes from 619.3 to 155.5.

Record Details View Full Data

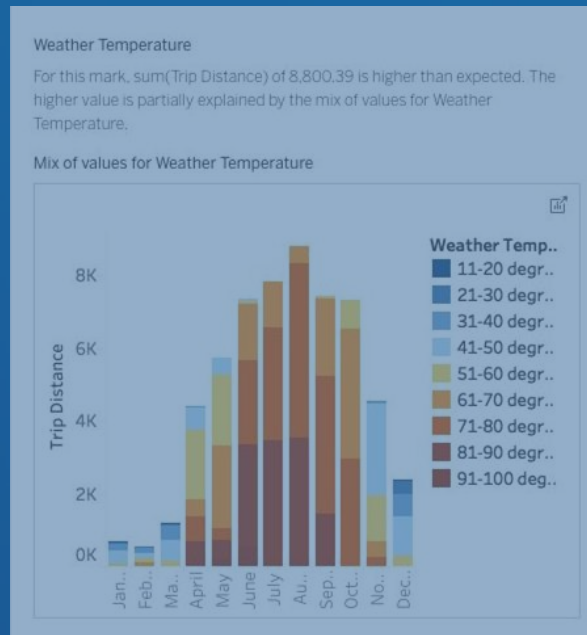
Total Time Rented (Hours)	Customer Type	Day of Week	Number of Rec
463.86666667	Customer	Saturday	0

Distribution of Row Values Within SUM(Total Time Rented (Hours))

Explain Data Demonstration



Augmented Analytics @ Tableau



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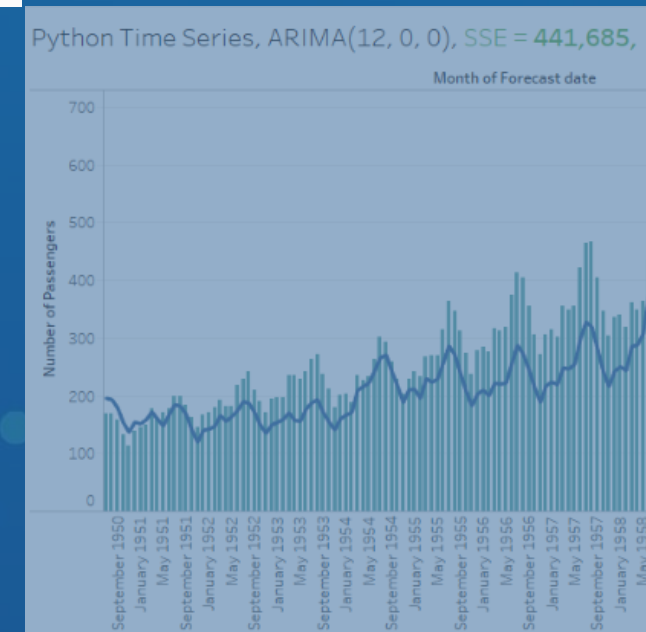
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Workbook Feature Team Viz

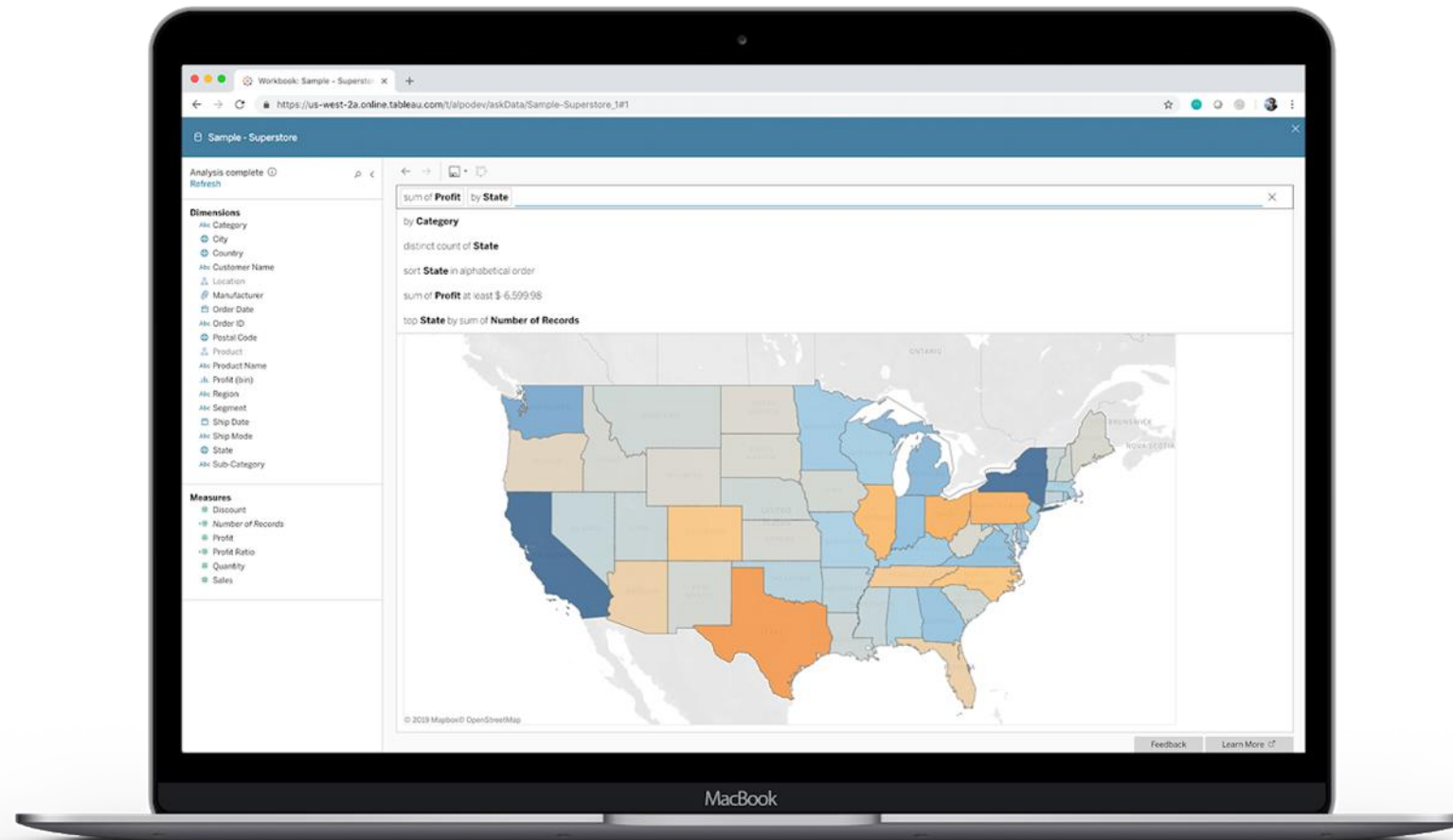
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Ask Data – Available with Tableau 2019.1+



- Interact with your data with natural language.
- Simply ask a question and get rich data visualizations.
- Get to your answers faster.

The Lifecycle of an Ask Data Question

Input Text

How many transactions processed last week?



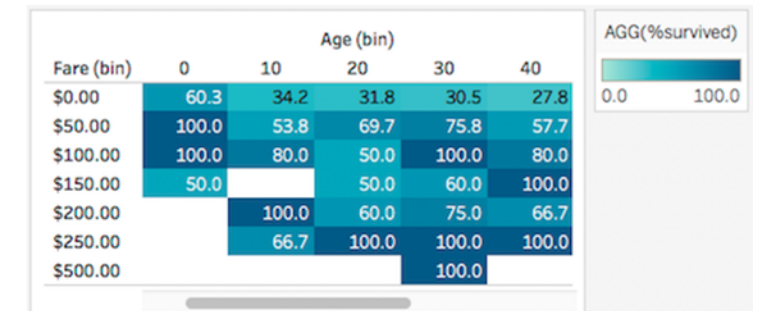
Natural Language Query

How many transactions were created during last week?

```
{ resource: transactions,
  filters: [
    filter: { field: created,
              filter: during,
              value: last week
            }
  ]
}
```



Tableau VizQL



Core Technology in Ask Data

Semantic Data
Model



Natural Language
Query Language



Natural Language
Parser



Intelligent Query Understanding

Ambiguity resolution and semantic understanding

Query

Recent income from chairs in Germany

Result

sum of Sales

Filter Product Sub-Category to Chairs

Country in DE

Order Date in the last 3 weeks

Combine methodologies from linguistic research with statistics and trained data models

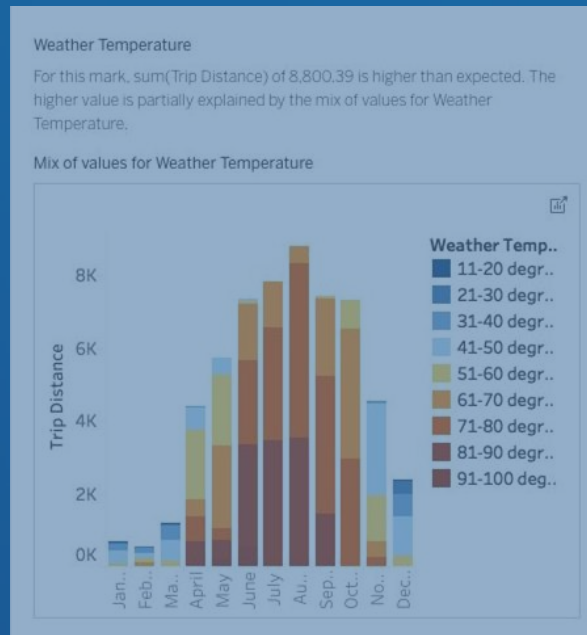
Vague Predicates

Synonym Resolution

Value Indexing

Semantic Knowledge

Augmented Analytics @ Tableau



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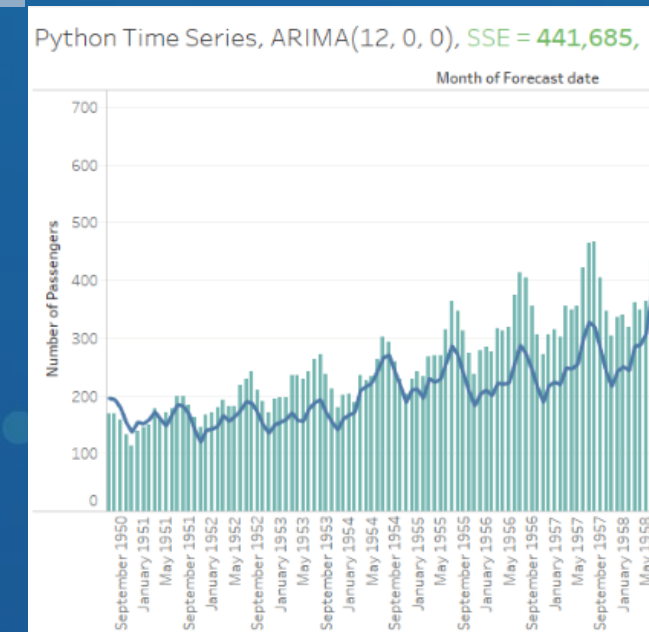
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“95% of my BI projects ask for data science.
Only 5% get it.”

Director of Analytics, eCommerce Retailer

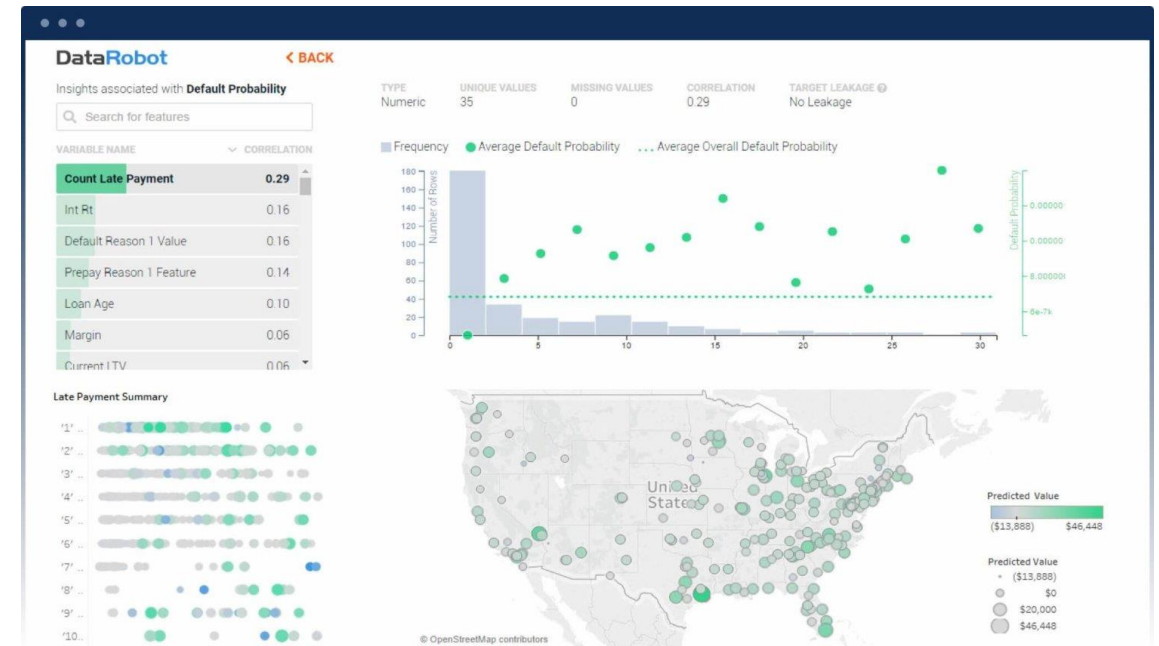
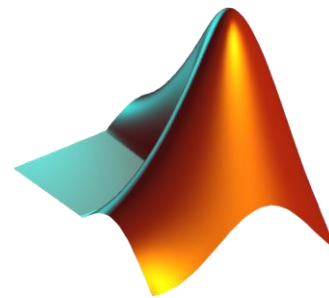
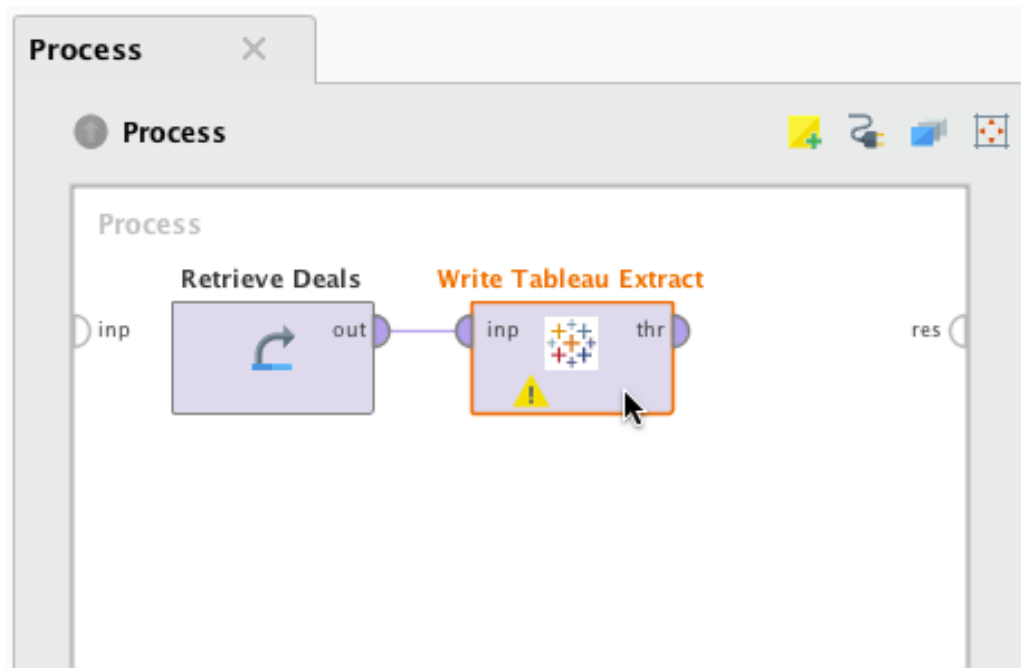
“By enabling managers to vary team composition during project execution, the novel TabPy (Tableau Python) approach can significantly improve cost efficiency.”

Davide Guatta, Sr. Data Scientist, BCG GAMMA

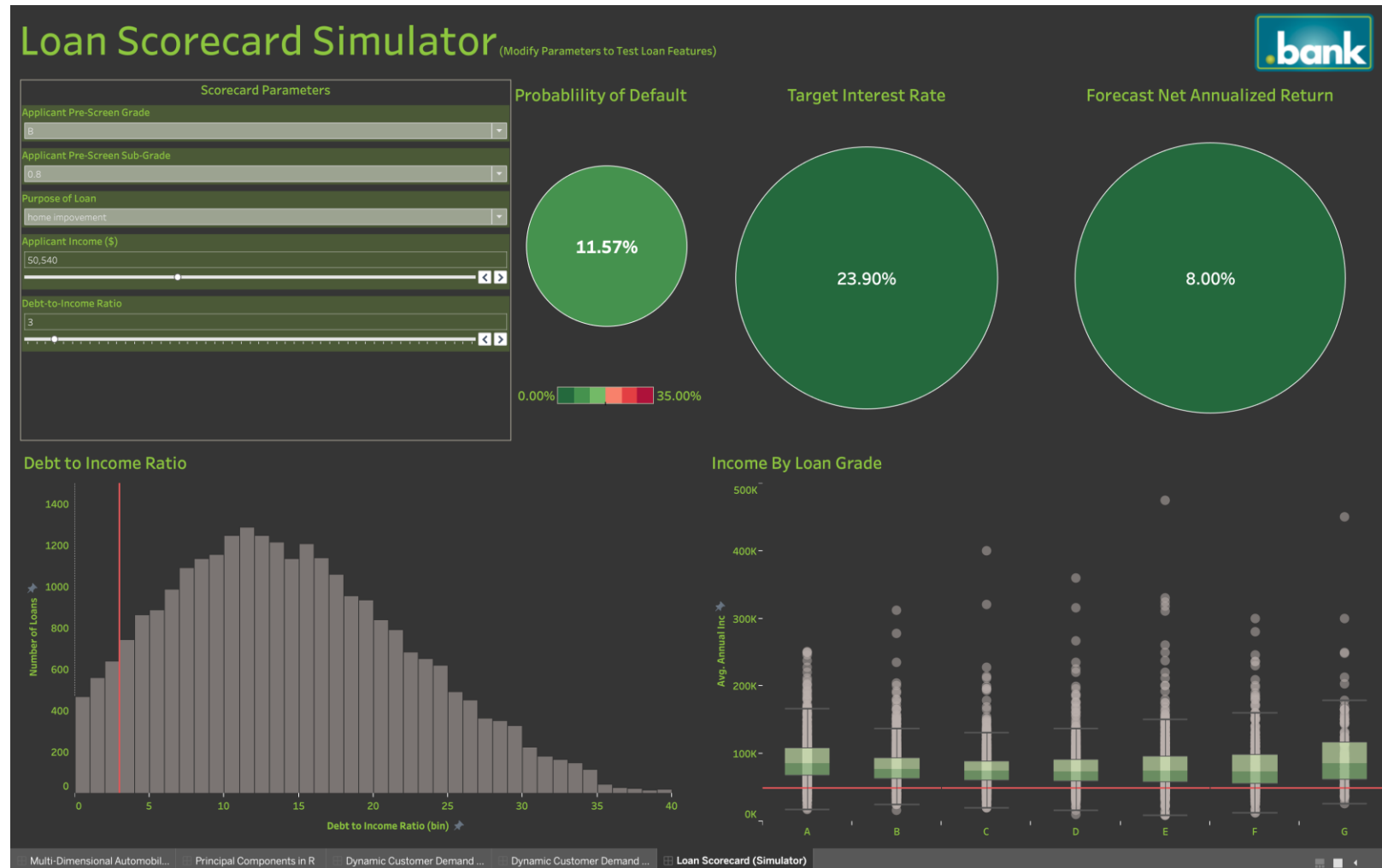
Data Science Platforms Integration



DataRobot



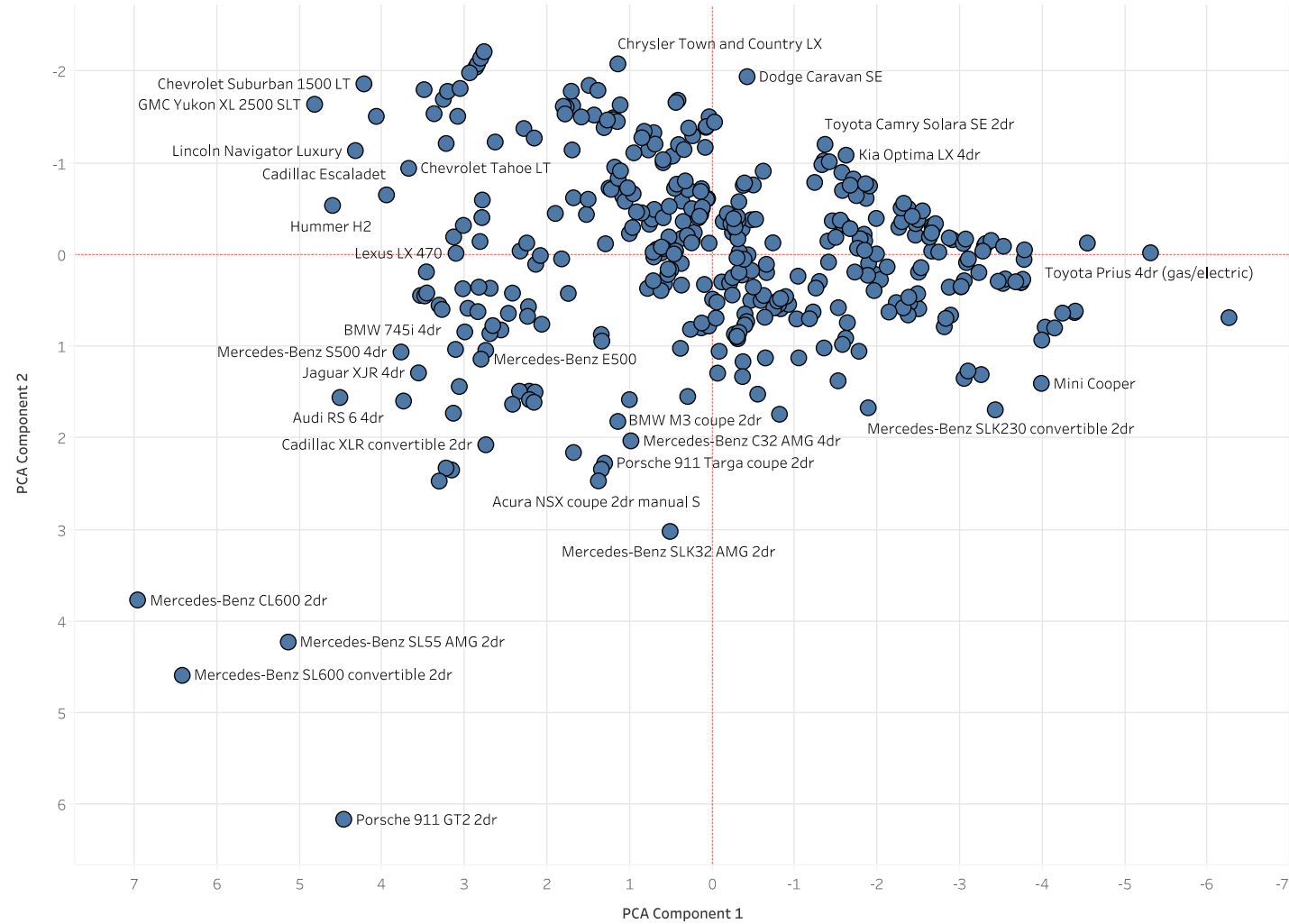
Operationalizing Machine Learning Demo



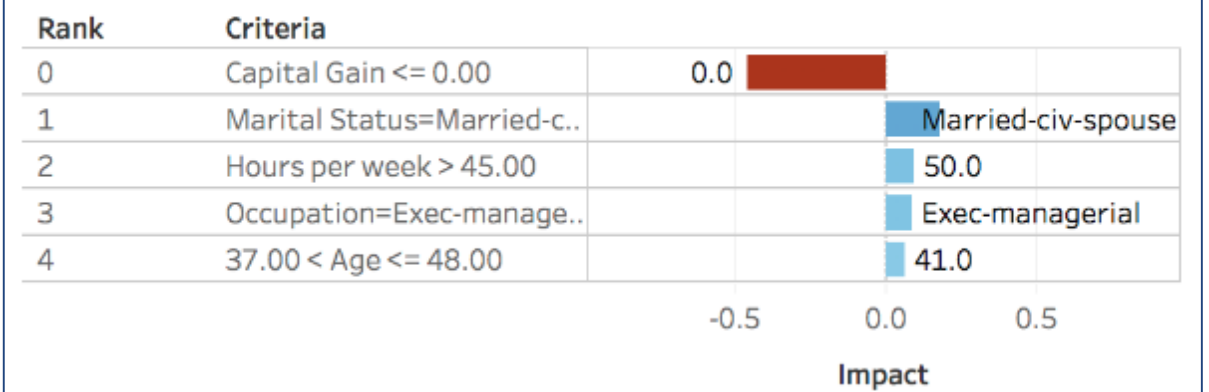
- Leverage existing data science investments
- Operationalize models without custom ETL / Application development
- Surface predictions in the engaging, interactive Tableau experience that business users are familiar with

Beyond Operationalizing ML Models

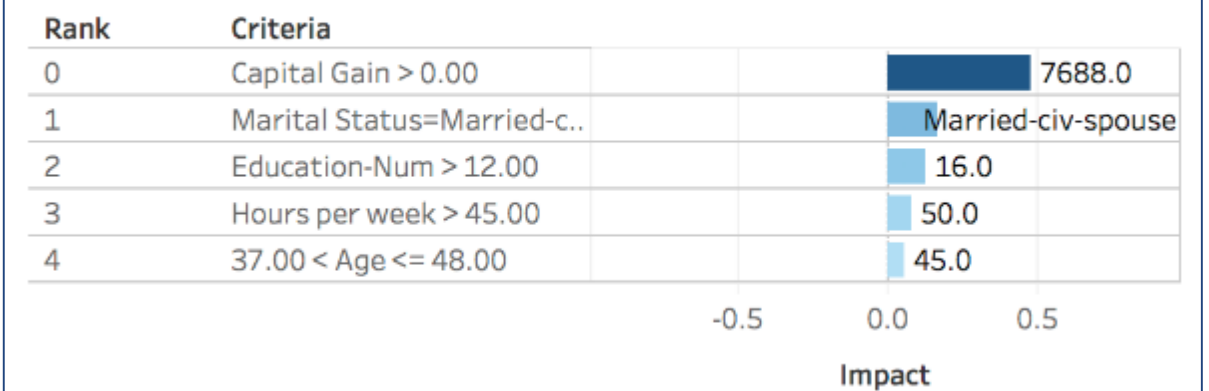
PCA



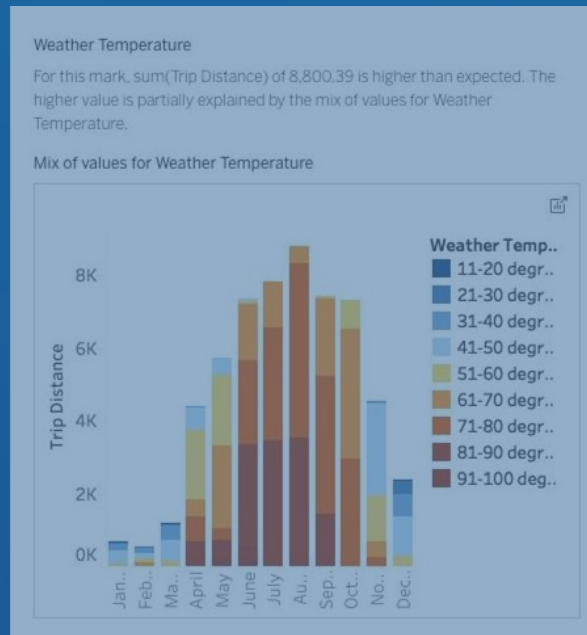
p(>50K): 0.9919



p(>50K): 0.9995



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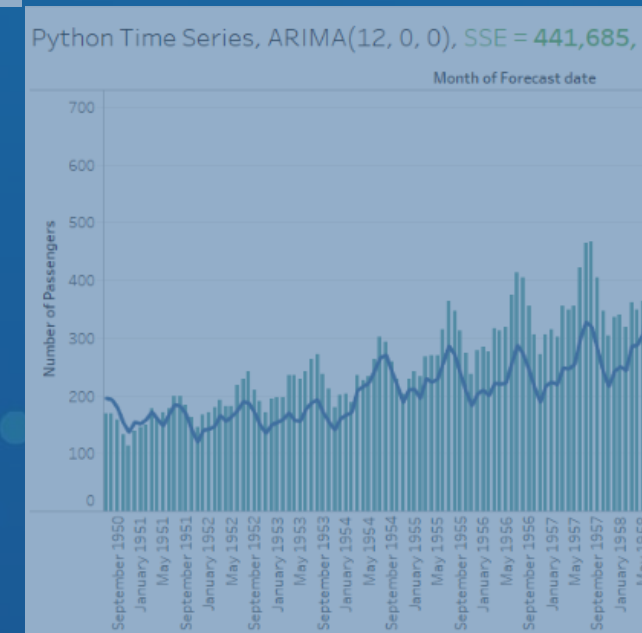
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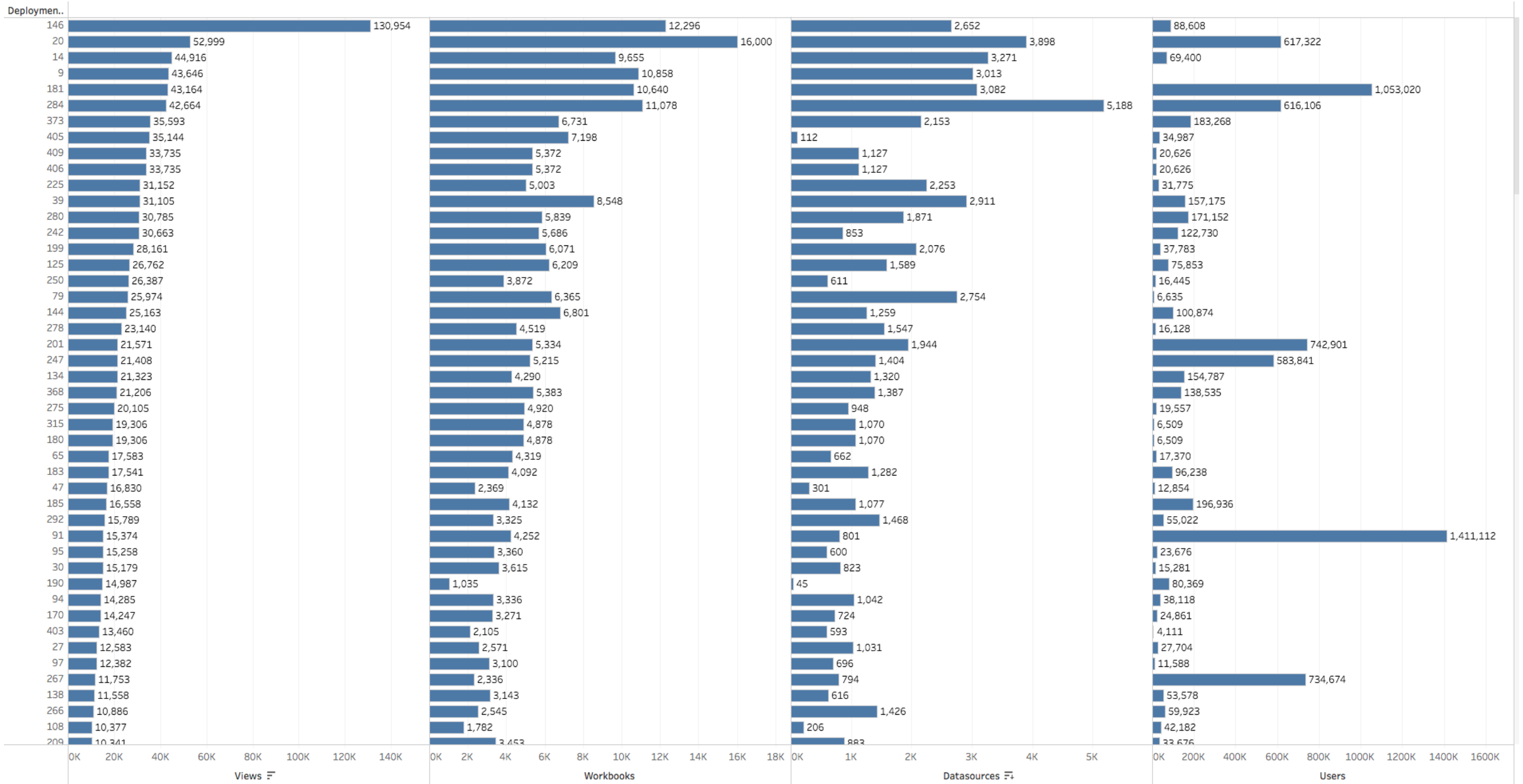
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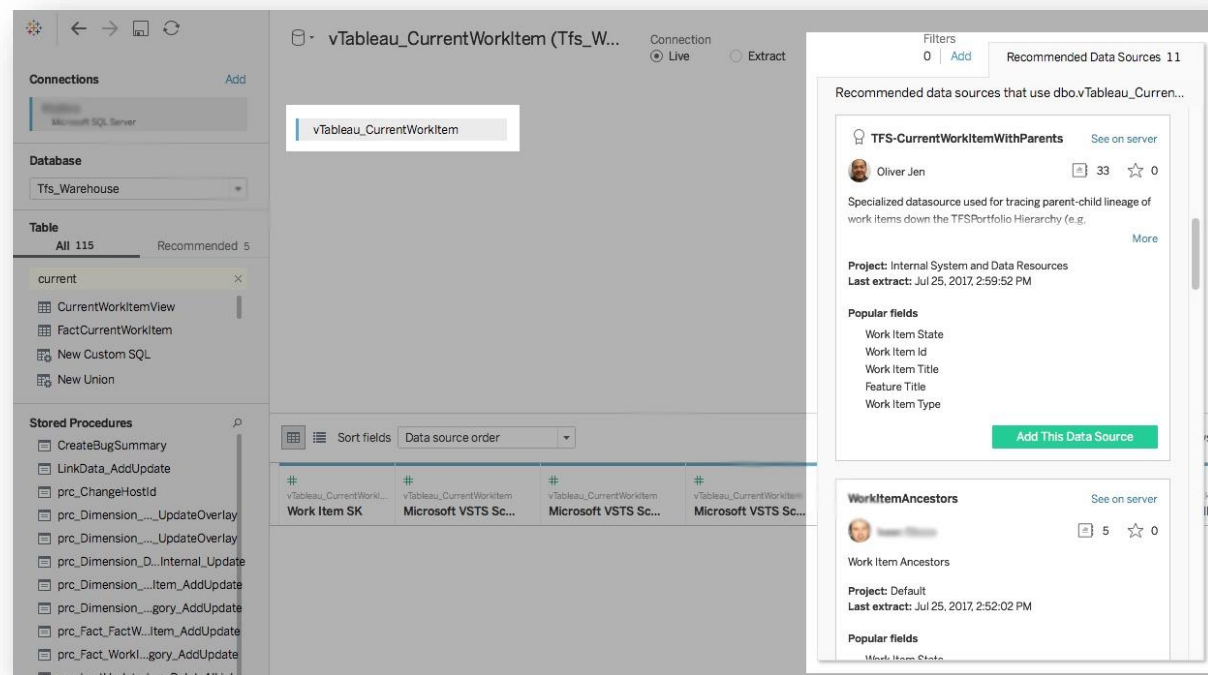
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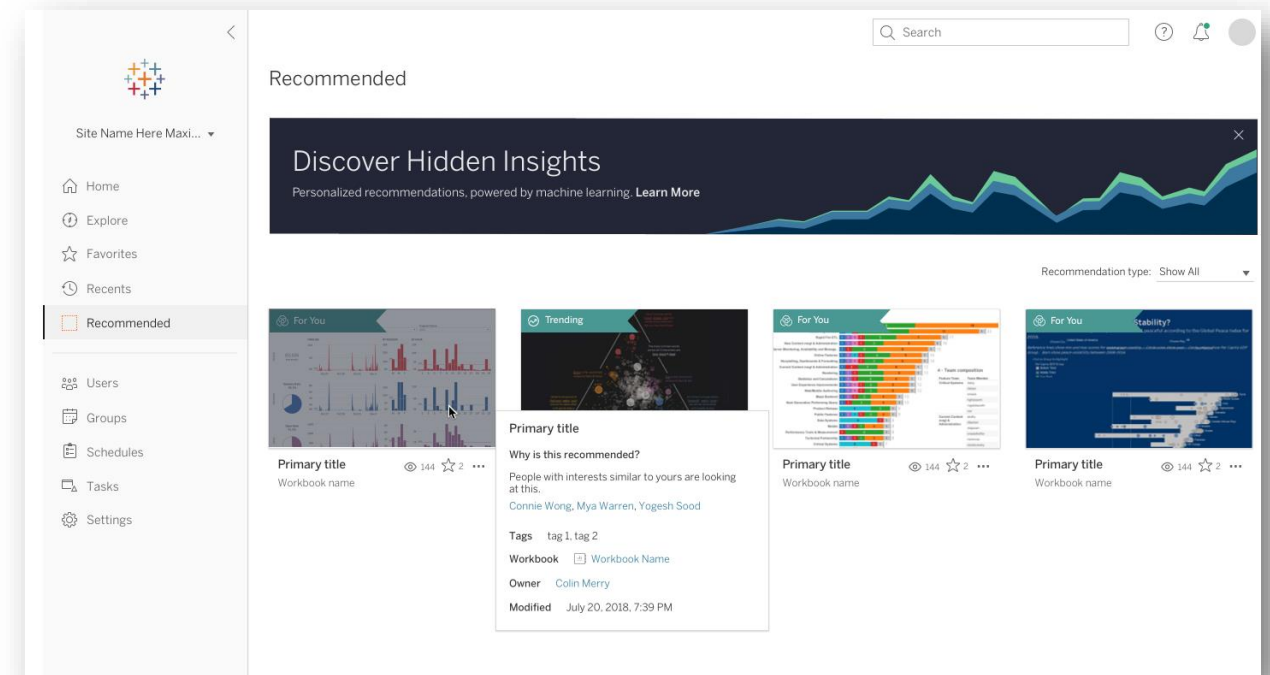


Recommendations

- Guide users to the right data and analysis as volume explodes.
- Give Tableau an understanding of what is relevant to a given user at a given time.

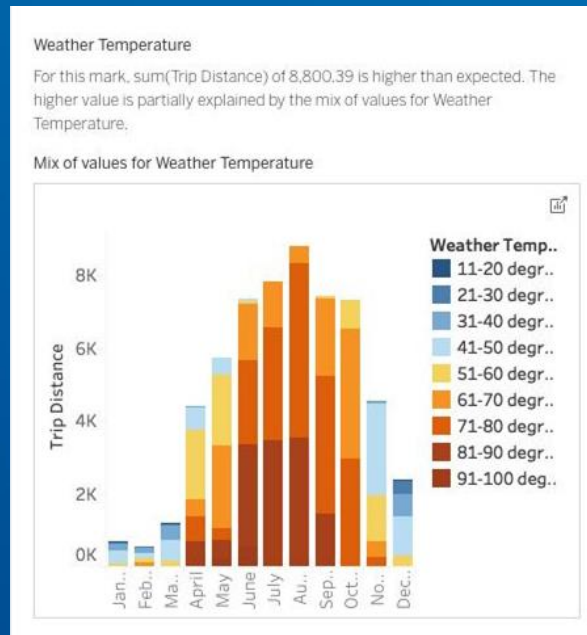


Personalized Data Recommendations (Tableau 10.3)



View Recommendations (Future)

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