TABLEAU CONFERENCE

TABLEAU CONFERENCE

#TC18

Accelerate Your Advanced Analytics
R, Python & MATLAB

Erik Polano
Associate Solution Architect
Tableau

Erwin van Laar
Team Lead, Product Consultancy
Tableau

Session Overview

TABLEAU CONFERENCE

Accelerate Y

Advanced anal finding the best
course of actio stom machine
learning model n reviews broad
types of advan possible, when
and how to use

Speaker(s):

Erik Polano,

Erwin van La

Content Type:

Level: Advance

Track: Analytic

Agenda

TABLEAU CONFERENCE

Tableau’s Built in Analytics

External Services Connection

Live Calculations

Materialized Calculations

Summary

TABLEAU CONFERENCE

Introduction

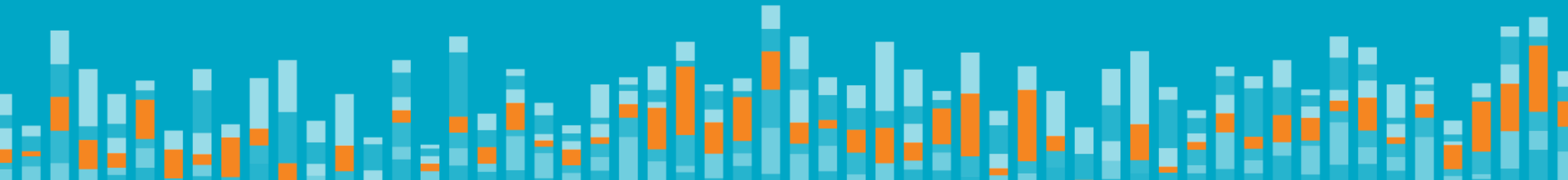
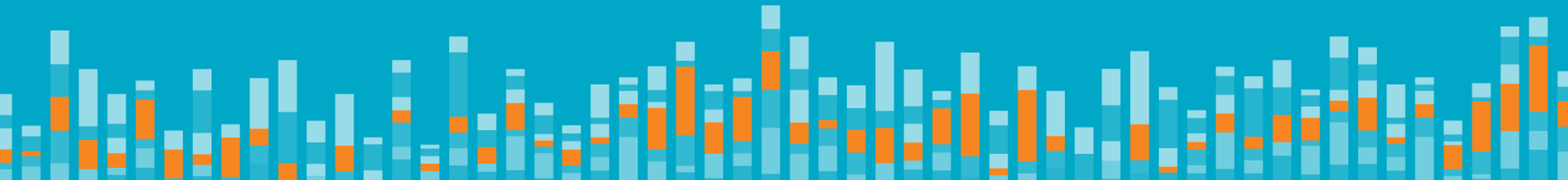


TABLEAU CONFERENCE

Erwin van Laar
Team Lead, Product Consultancy, Tableau

Erik Polano
Associate Solution Architect, Tableau



Objective

TABLEAU CONFERENCE

Create interactive dashboards…

Without the consumer needing to understand code…

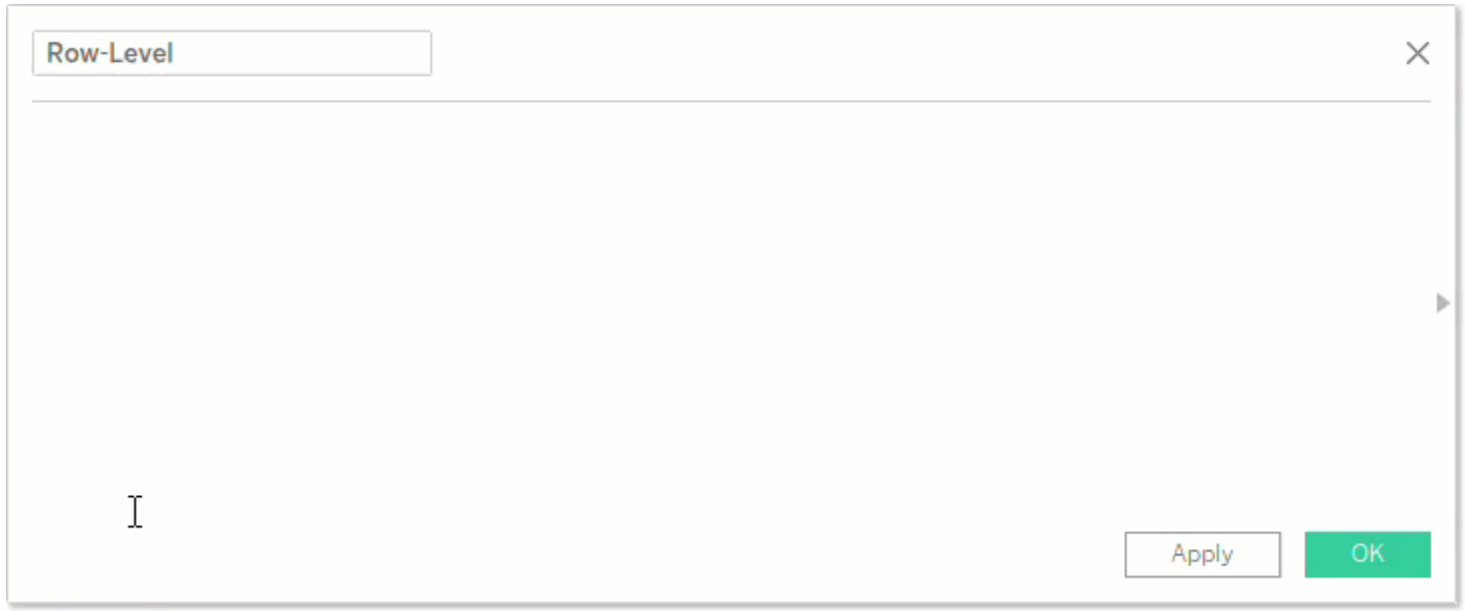
That enables them to answer questions…

That are not contained in the underlying data source

Built in Analytics in Tableau

TABLEAU CONFERENCE

Row level calculations

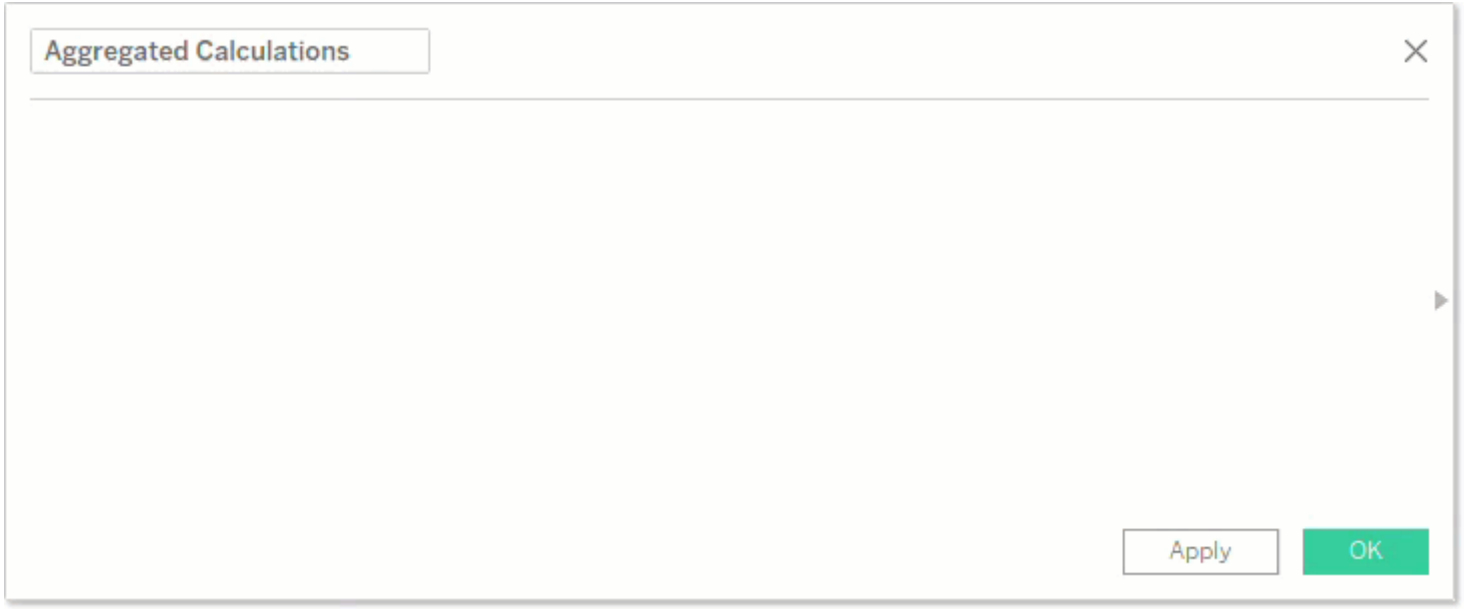


Built in Analytics in Tableau

TABLEAU CONFERENCE

Row level calculations

Aggregated Calculations



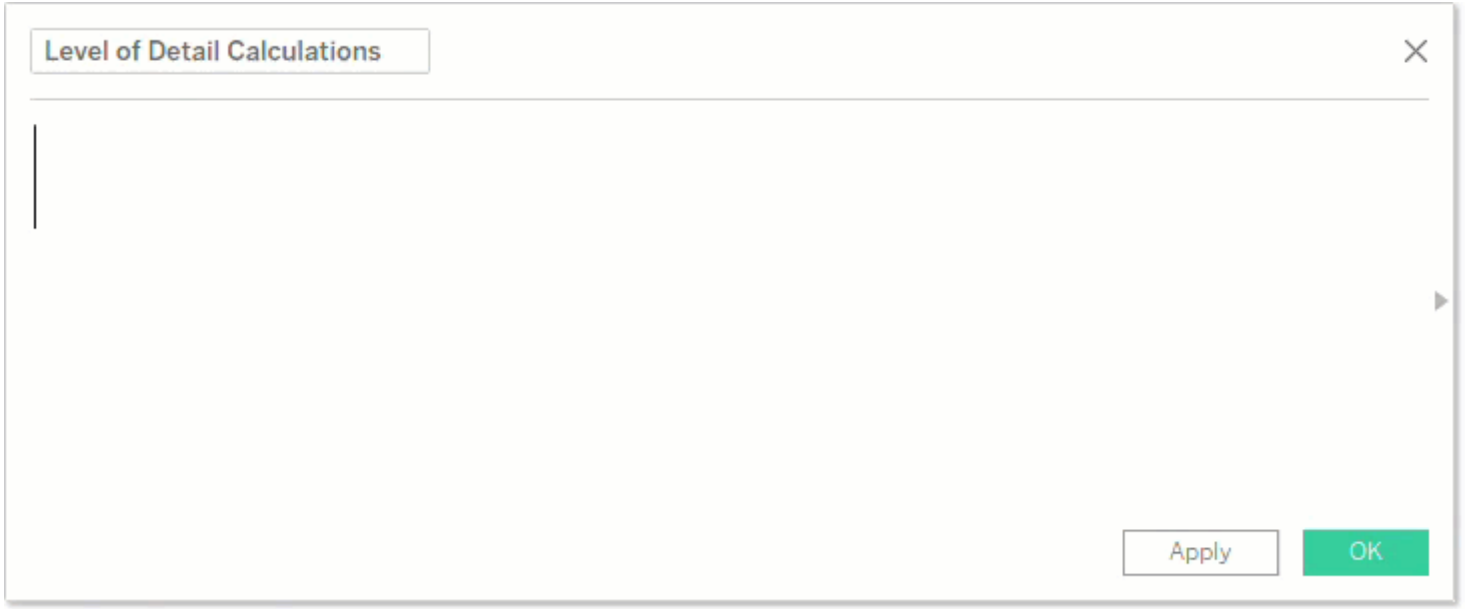
Built in Analytics in Tableau

TABLEAU CONFERENCE

Row level calculations

Aggregated Calculations

Level of Detail expressions



Built in Analytics in Tableau

TABLEAU CONFERENCE

Row level calculations

Aggregated Calculations

- Level of Detail expressions
- Table Calculations

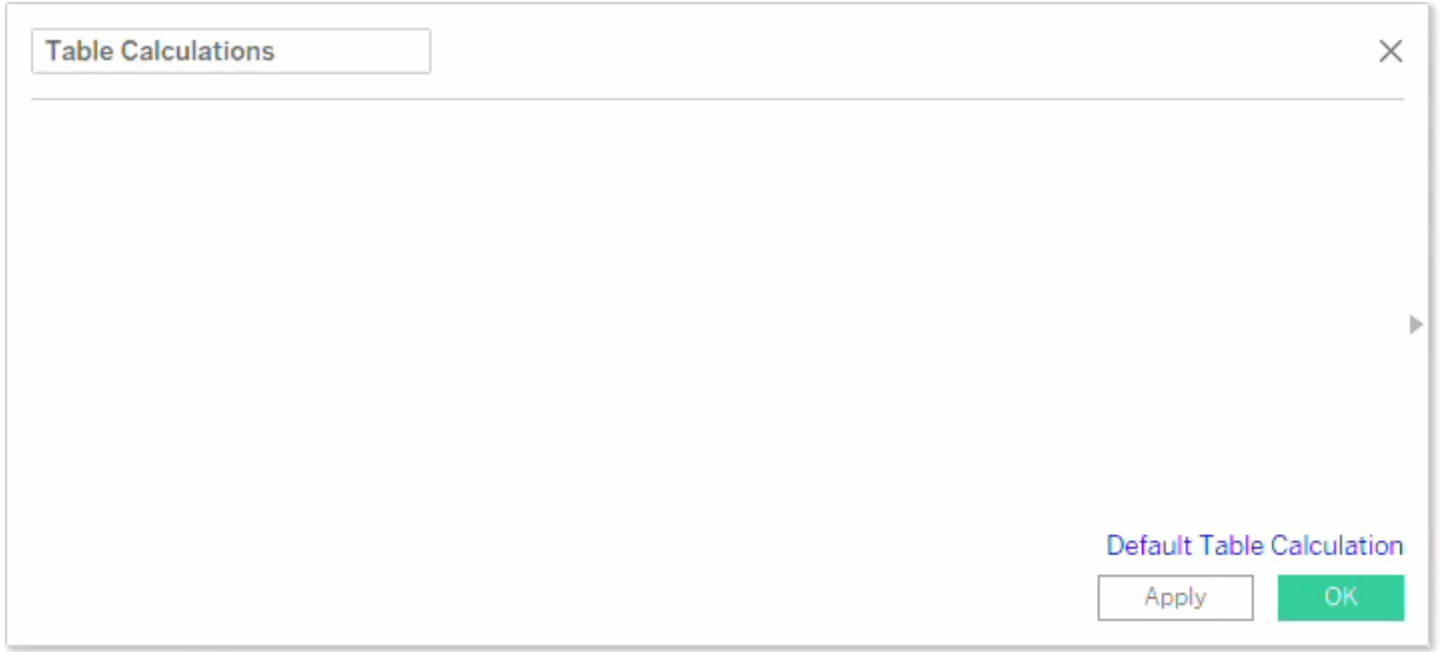
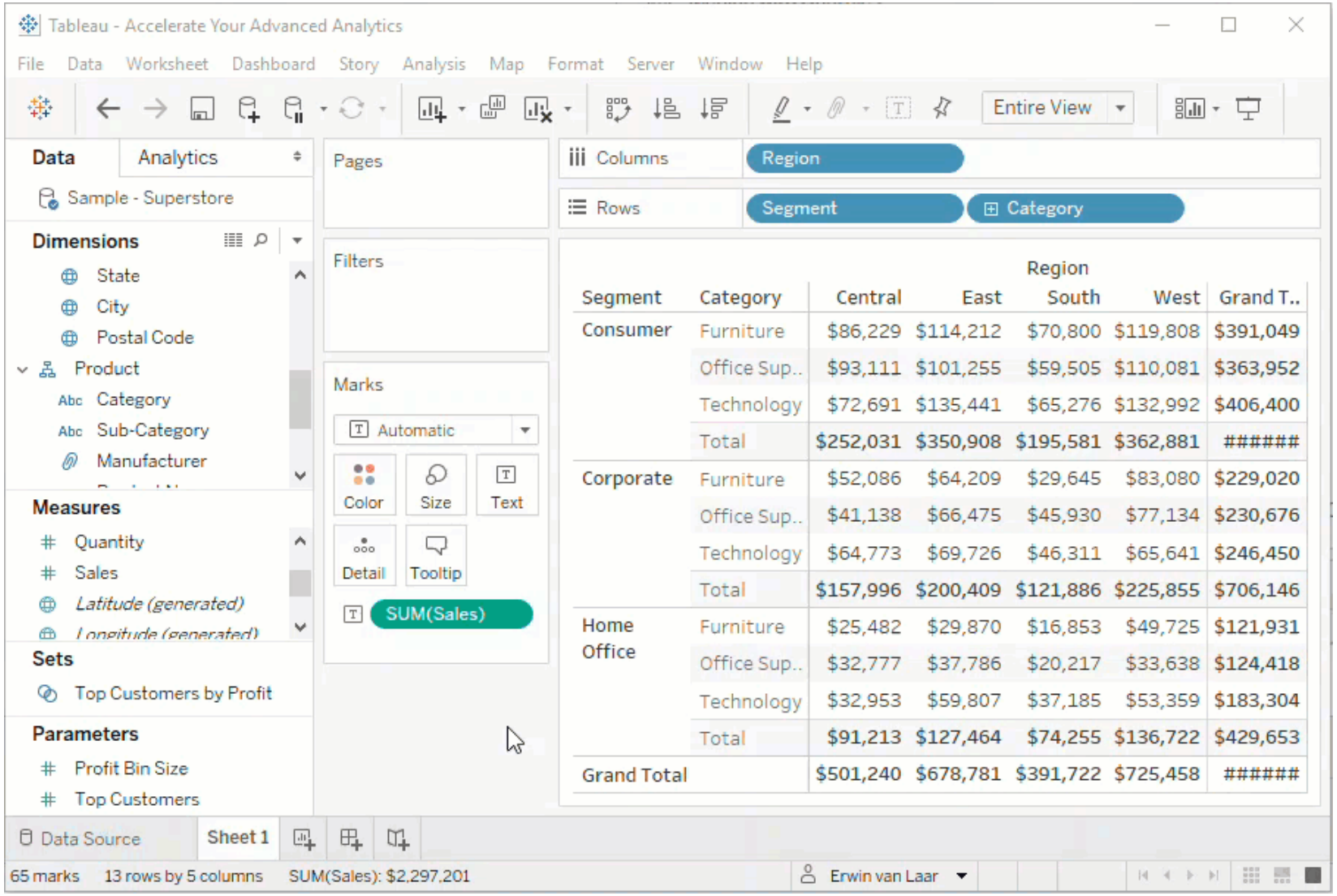


Table Calculations

TABLEAU CONFERENCE

Based on the Level of Aggregation in the View



Built in Analytics in Tableau

TABLEAU CONFERENCE

Row level calculations

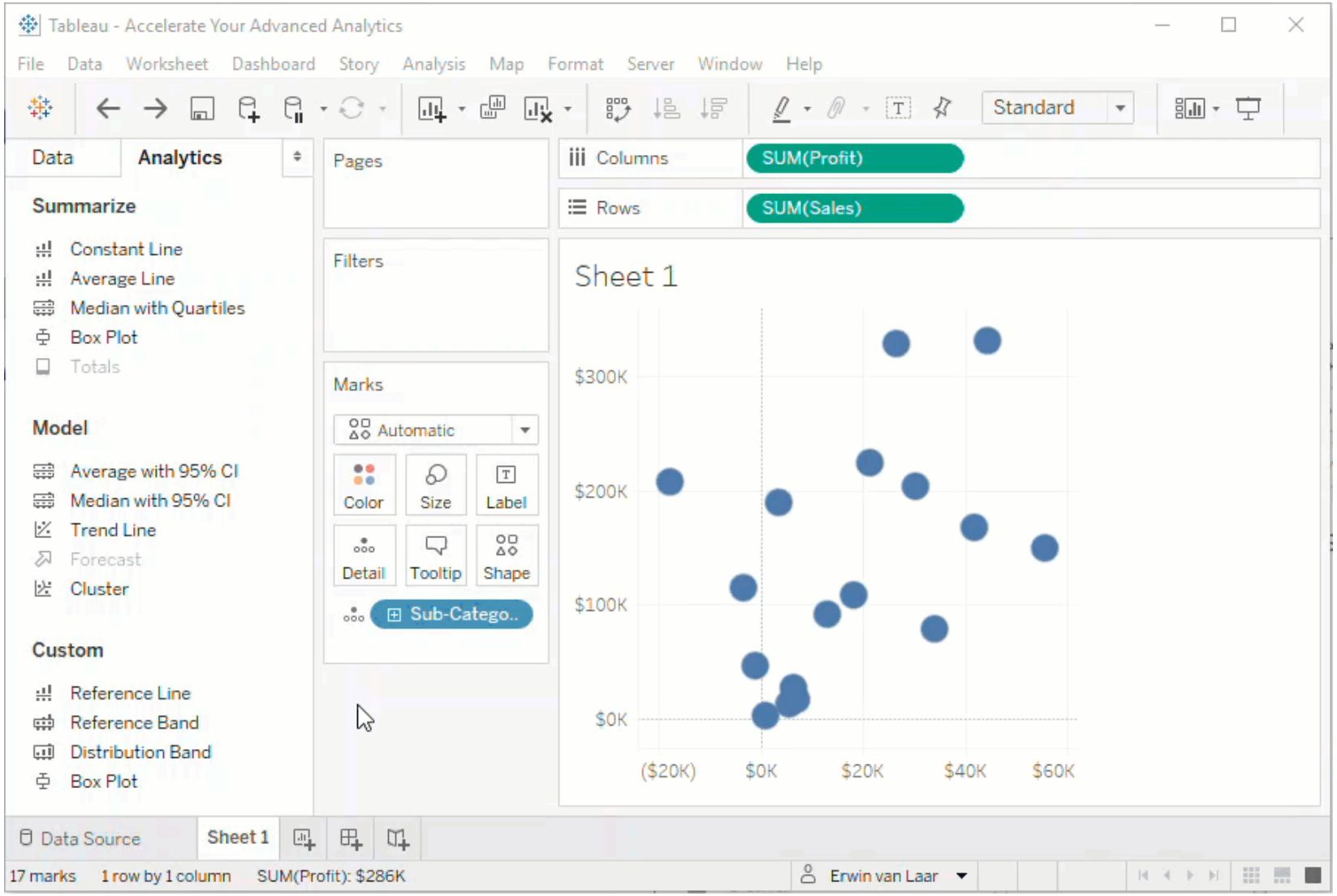
Aggregated Calculations

- Level of Detail expressions
- Table Calculations
- Analytics Objects (ref lines, trend lines, forecast, clusters)

Analytic Objects

TABLEAU CONFERENCE

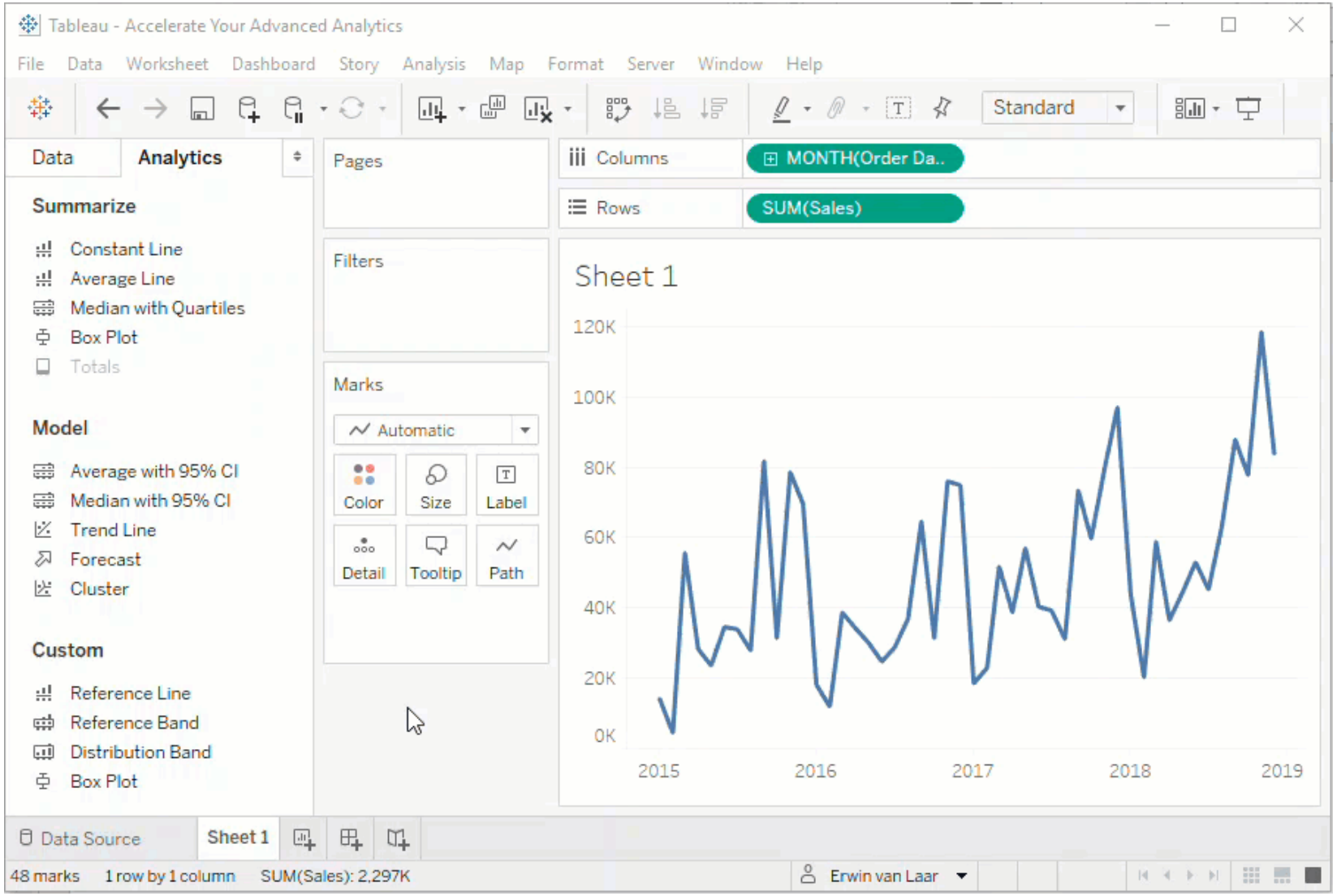
Drag & Drop Analytical features



Analytic Objects

TABLEAU CONFERENCE

Drag & Drop Analytical features



But what if I want more?

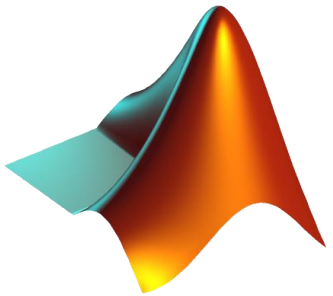
Different Model than Standard Tableau Functions

More complex models

Models trained on your data

Need more flexibility

External Services



Objective

TABLEAU CONFERENCE

Create interactive dashboards…

Without the consumer needing to understand code…

That enables them to answer questions…

That are not contained in the underlying data source…

By leveraging an Advanced Analytical Language

TABLEAU CONFERENCE

External Services

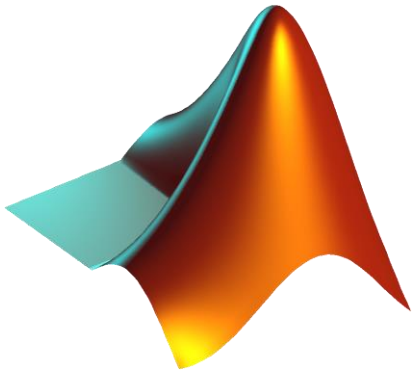
External Services Connection

TABLEAU CONFERENCE

R (8.1+)

Python (10.1+)

MATLAB (10.4+)



SCRIPT functions

TABLEAU CONFERENCE

SCRIPT_BOOL

SCRIPT_INT

SCRIPT_REAL

SCRIPT _STR

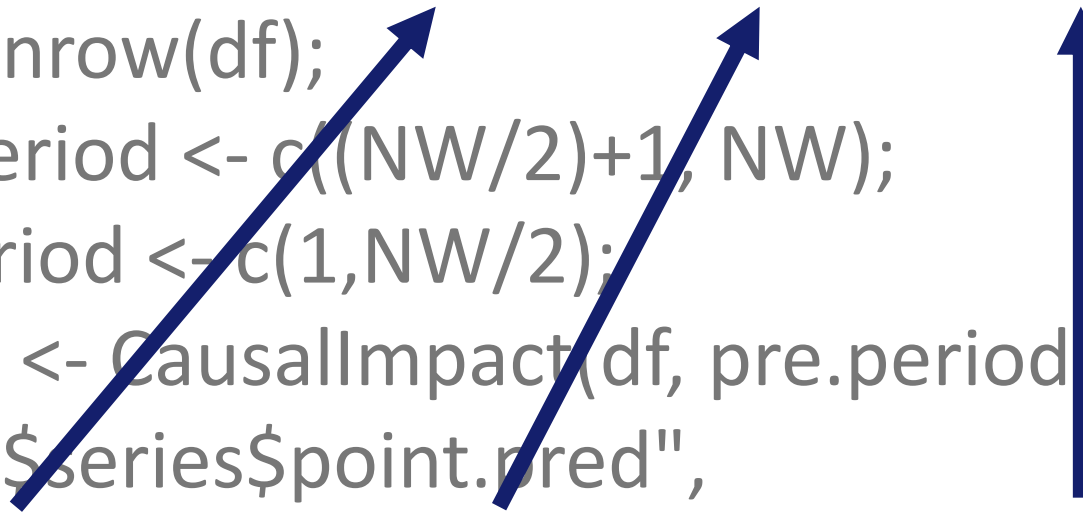
Script defines the type of outcome that Tableau expects

They will be run as a Table Calculation

Example

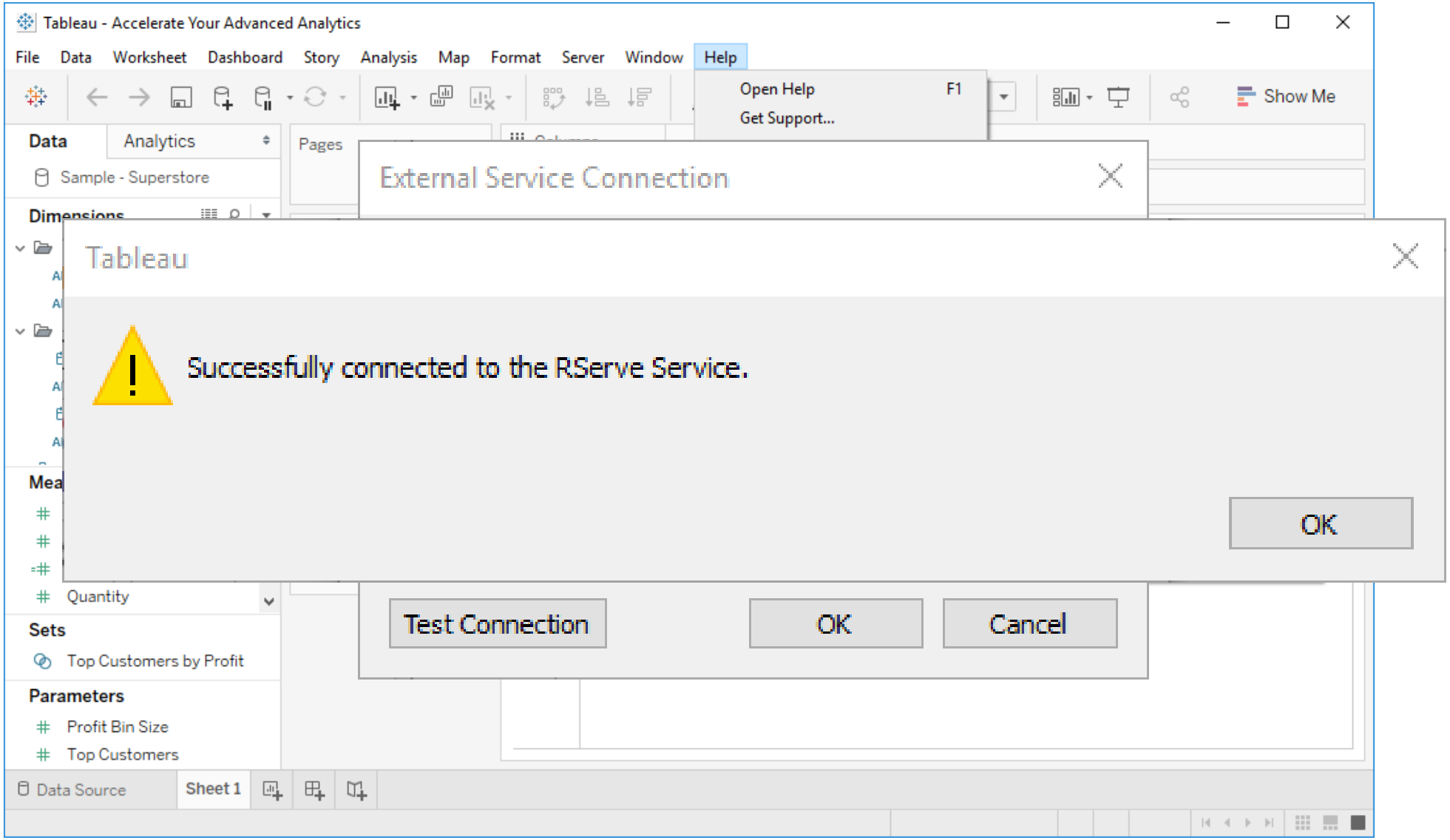
TABLEAU CONFERENCE

```
SCRIPT_REAL("library(CausalImpact);
df <- data.frame(y=.arg1,x1=.arg2,x2=.arg3);
NW <- nrow(df);
post.period <- c((NW/2)+1, NW);
pre.period <- c(1,NW/2);
impact <- CausalImpact(df, pre.period, post.period);
impact$series$point.pred",
SUM([Profit]), SUM([Quantity]), SUM([Sales]))
```



Manage External Services Connection

TABLEAU CONFERENCE



Connecting Tableau to an External Service

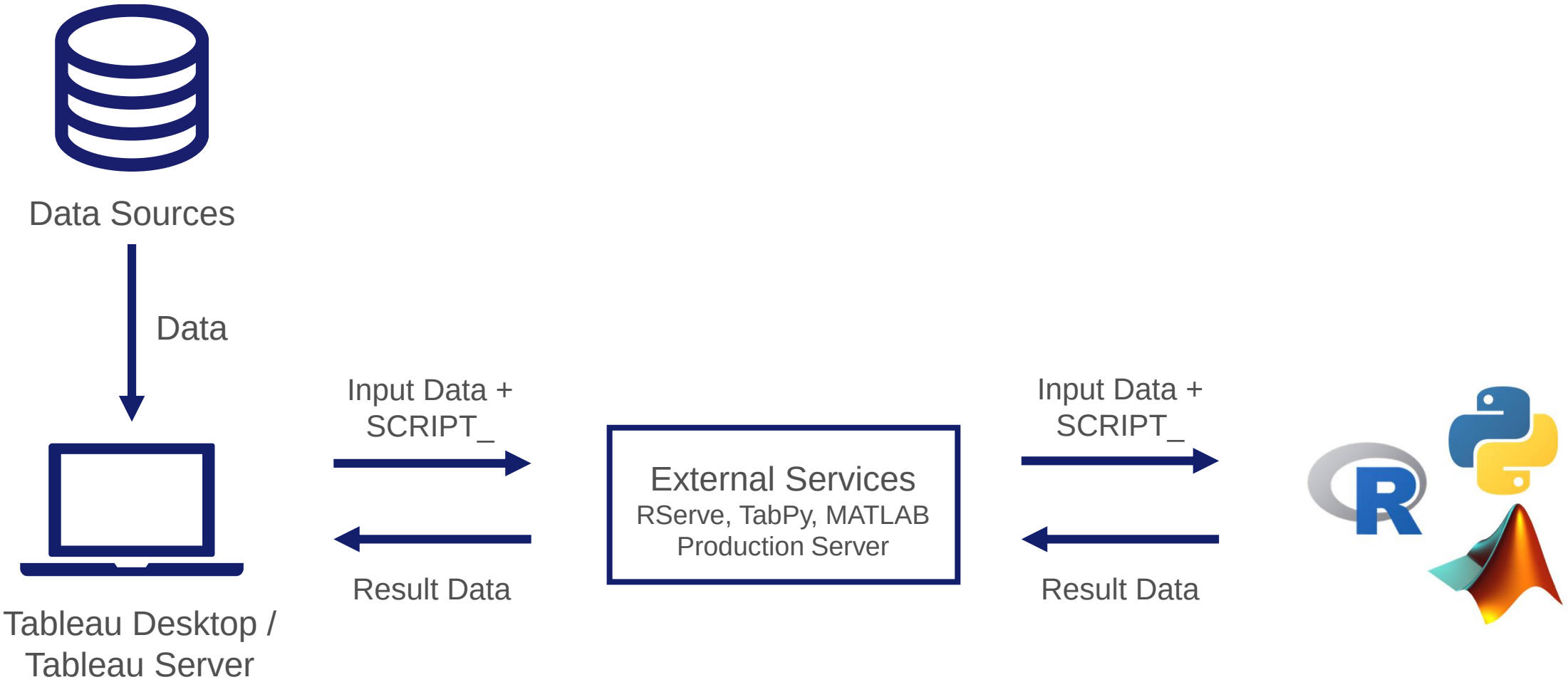


TABLEAU CONFERENCE

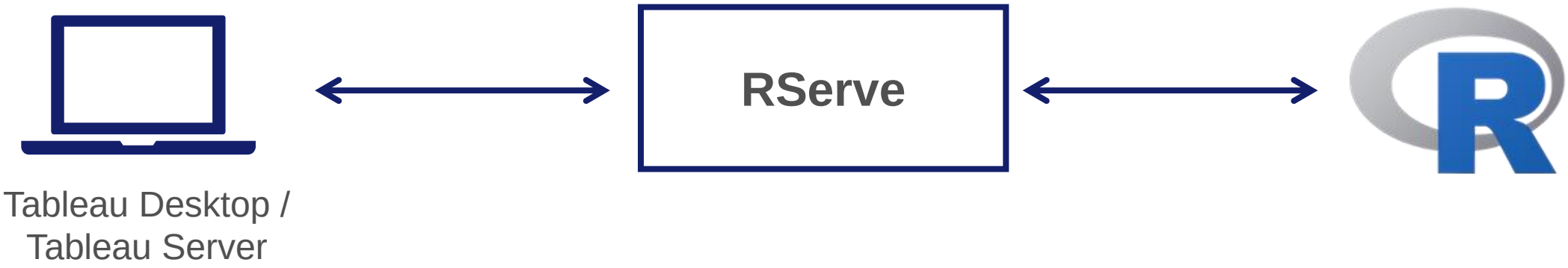
R (matey!)

R - RServe

TABLEAU CONFERENCE

TCP/IP server

Allows other programs to use facilities of R



Examples

TABLEAU CONFERENCE

- Tableau helps you see visually identify patterns in Data

- But are those patterns significantly different?

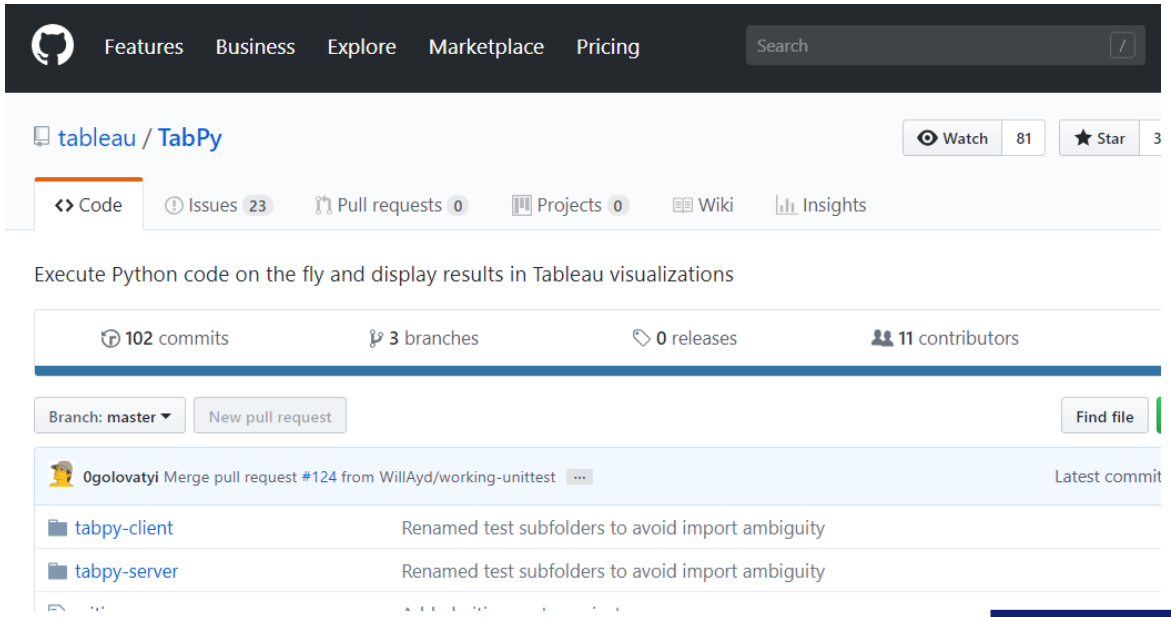
→ T-Test

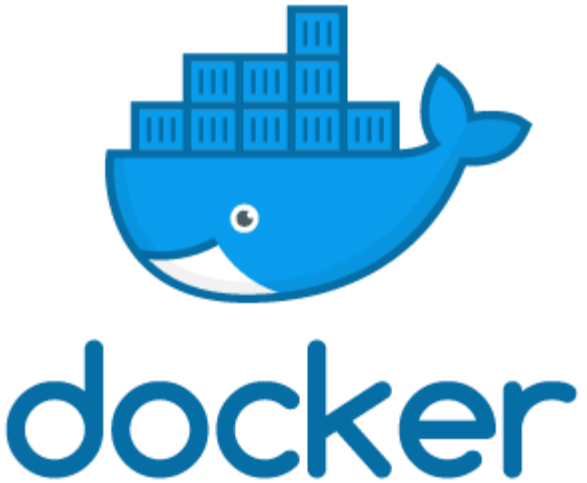
TABLEAU CONFERENCE

Python

Python Set Up

Tableau Python Server (TabPy)





numpy (1.11.2)
pandas (0.19.1)
scikit-learn (0.17.1)
scipy (0.18.1)
textblob (0.11.1)
nltk (3.2.1)
vaderSentiment (0.5)
geopy (1.11.0)
requests (2.12.4)
reverse_geocoder (1.5.1)

Tableau Desktop /
Tableau Server

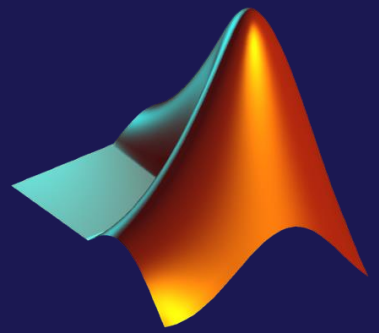
Example

TABLEAU CONFERENCE

Twitter Sentiment Analysis

TABLEAU CONFERENCE

MATLAB



Two different options

TABLEAU CONFERENCE

MATLAB allows to connect to models in two different ways:

External Service Connection

Web Data Connector

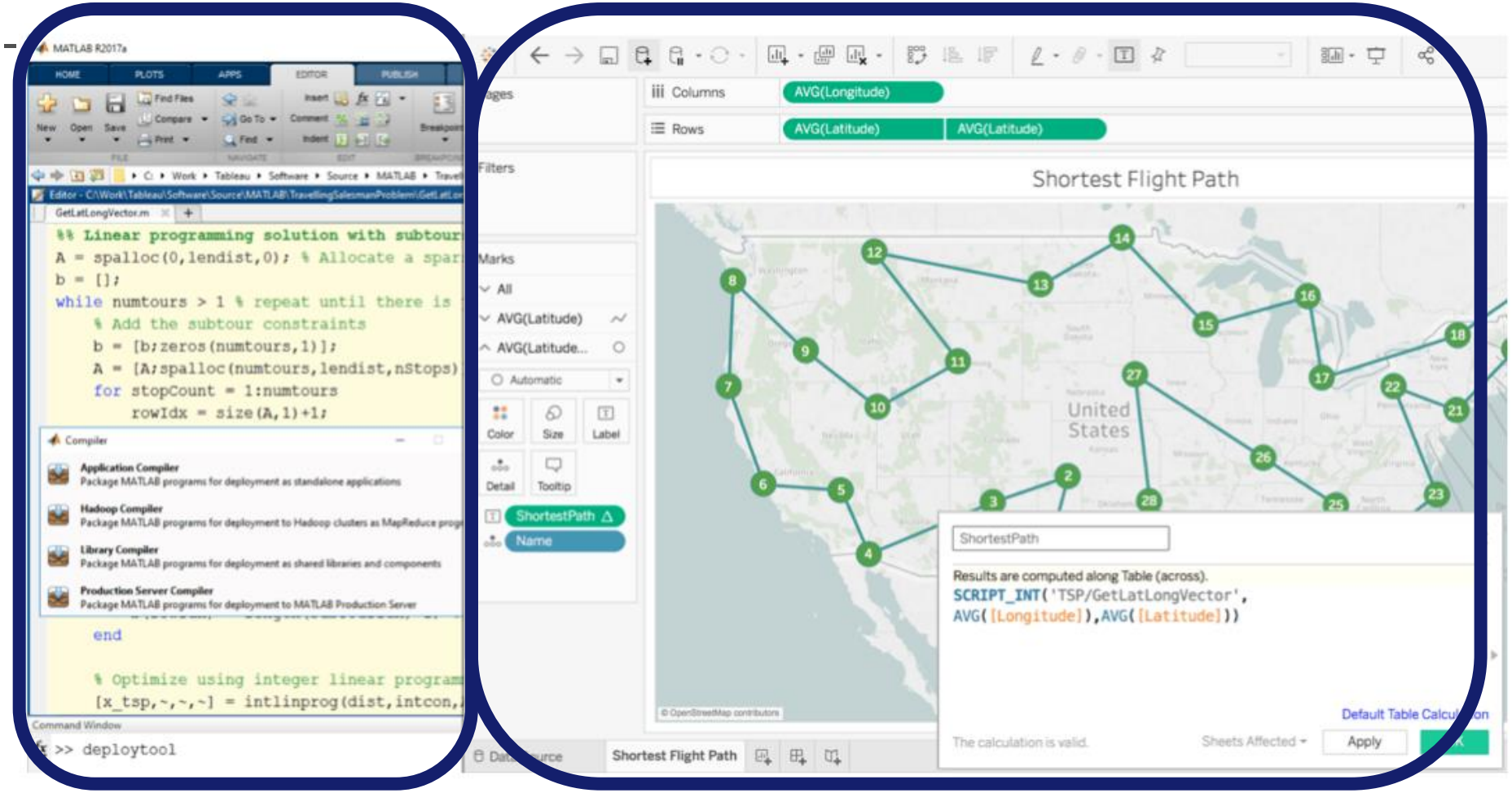
Option 1: External Service Connection

Define Functions in MATLAB Production Server

Call Functions through Calculated Fields

Possible to filter and re-

Advantage: Flexibility.



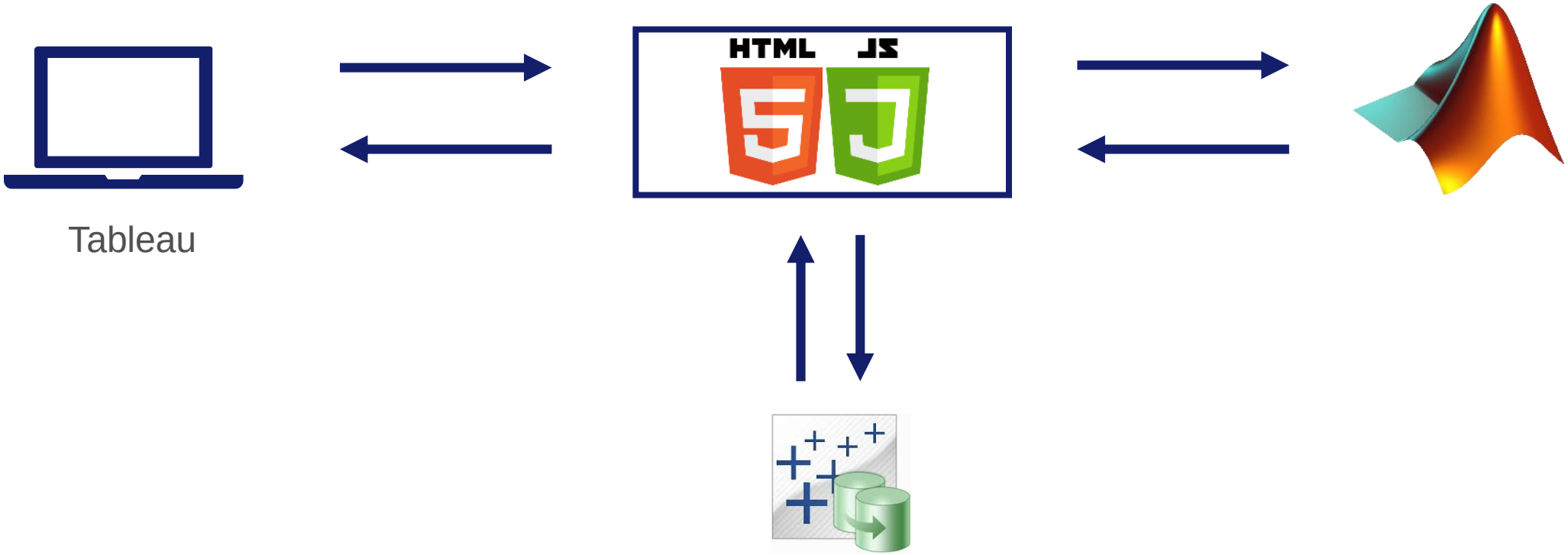
Option 2: Web Data Connector

Request Data Source at Initial Data Source Stage

Request sent once to MATLAB and all results written on row level into extract

Advantage: Performance

Advantage: All data can be used regardless of aggregation level



Example

Shortest Salesperson Route

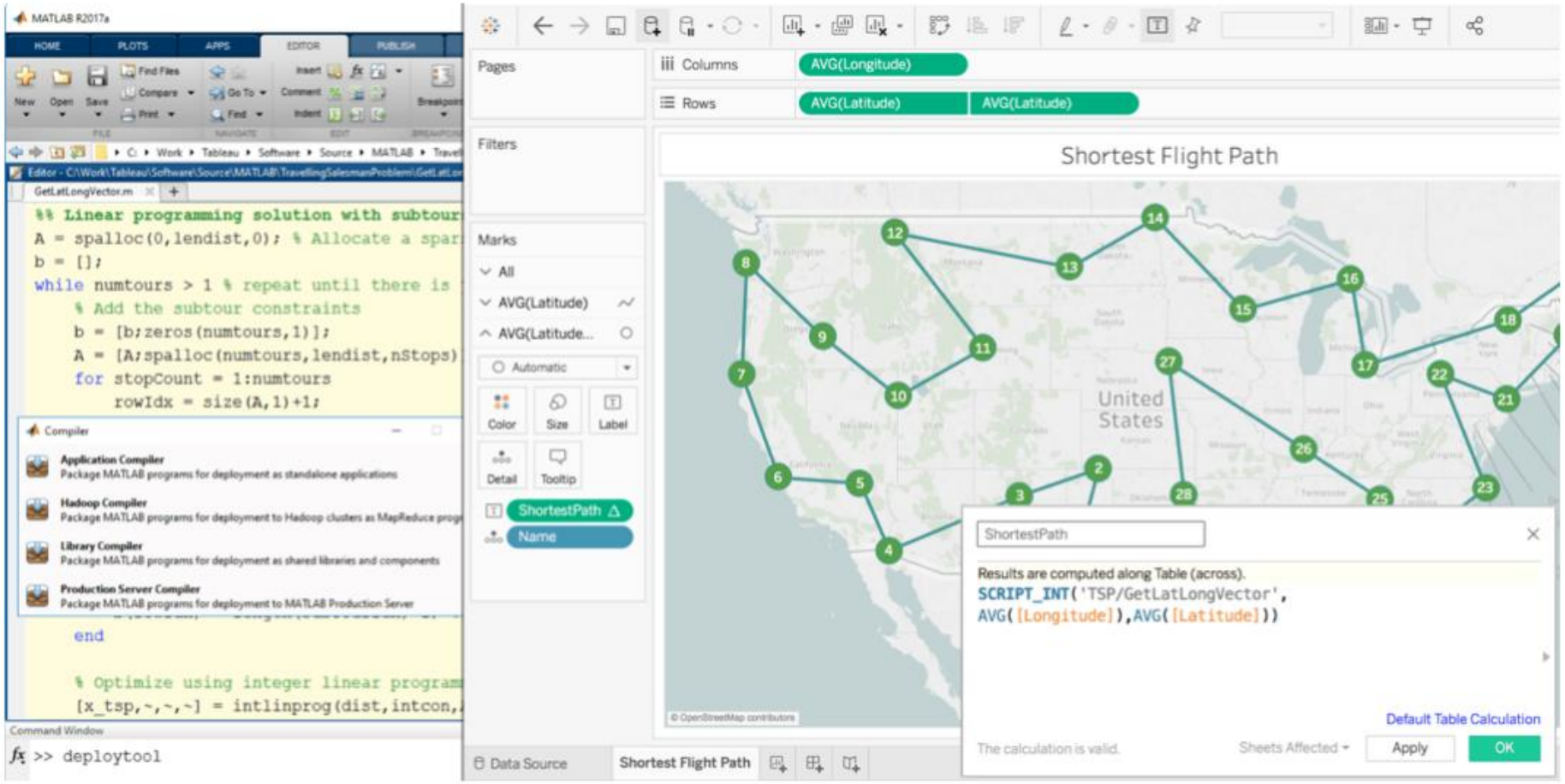


TABLEAU CONFERENCE

Materialized Calculations

Categorization

TABLEAU CONFERENCE

Twitter sentiment analysis

Customer Identification

Reclassification

Row-level calculations

Large volumes - Example

TABLEAU CONFERENCE

- **ABN AMRO Clearing**
  - Marleen Meier, Quantitative Risk Analyst
- **Clear and finance > 16 Mio trades per day**

- **Model: Correlation Haircut Model (COH)**
- **Used on all asset-classes**
  - Equity, Commodity, Fixed Income, Currency

TABLEAU CONFERENCE

“Tableau made our Machine Learning Project a Success

Brian Doelkahar

Head of Quantative Modelling ABN AMRO Clearing

TABLEAU CONFERENCE

Questions?

TABLEAU CONFERENCE

Summary

What do External Services bring to Tableau?

TABLEAU CONFERENCE

Deeper Statistics

Machine Learning

Productionalize Predictive Modeling

More Expressive Power

What does Tableau bring to External Services?

TABLEAU CONFERENCE

Data Connectivity

Explore at the Speed of Thought

Interactive Visual Storytelling

Conclusion

TABLEAU CONFERENCE

RELATED SESSIONS

Advanced Analytics at Scale

Wed | 3:30pm – 4:30pm | MCCNO – L2 – New Orleans Theater C

Tableau + Python = ♡

Wed | 1:45pm – 2:45pm | MCCNO - L2 - 220

TABLEAU CONFERENCE

RELATED SESSIONS

Advanced Analytics at Scale

Wed | 3:30pm – 4:30pm | MCCNO – L2 – New Orleans Theater C

R…you ready? Jedi stats with R & Tableau

Wed | 10:15am – 12:45pm | MCCNO – L3 – 356

TABLEAU CONFERENCE

RELATED SESSIONS

Embedding Tableau for self-service data science

Wed | 12:00pm – 1:00pm | MCCNO – L2 – La Nouvelle Ballroom B

Data science applications with TabPy/R

Wed | 12:00pm – 1:00pm | MCCNO – L2 – New Orleans Theater B

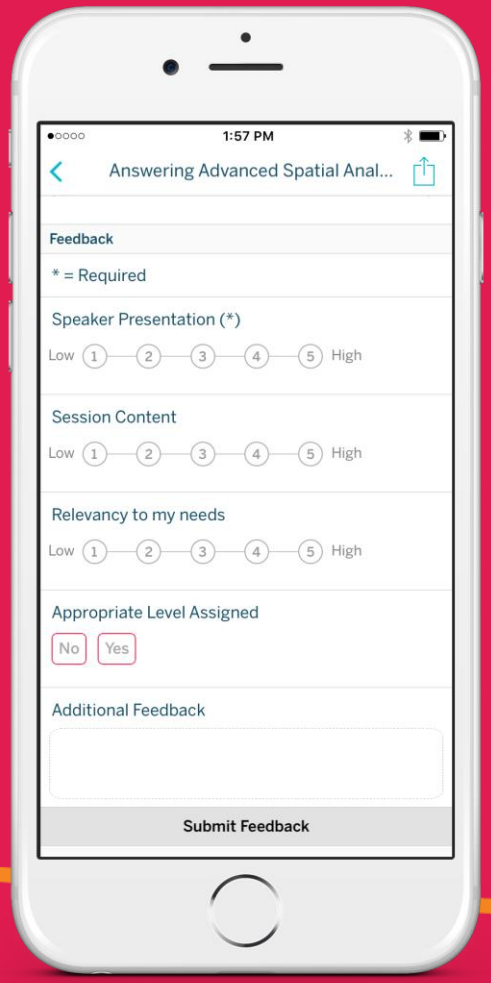
TABLEAU CONFERENCE

SESSION REPEATS

Accelerate Your Advanced Analytics R, Python & MATLAB

Wed | 10:45am – 11:45am | MCCNO – L2 – La Nouvelle Ballroom B

TABLEAU CONFERENCE



Please complete the session survey from the Session Details screen in your TC18 app

TABLEAU CONFERENCE

Thank you!

Erik Polano
epolano@tableau.com

Erwin van Laar
evanlaar@tableau.com

Resources

TABLEAU CONFERENCE

- How Tableau Brought ABN AMRO's Machine Learning Project to Life
  - https://www.youtube.com/watch?v=mFpvf1brgN4&t=20s
- Alteryx Analytic Templates for Tableau
  - https://pages.alteryx.com/starter-kit-Tableau-FNO.html?_ga=2.233432348.38610897.1535546581-1457225964.1534502381

TABLEAU CONFERENCE