

Empowering India: Analysing the Evolution of Union Budget Allocations for Sustainable Growth

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Introduction

India's Union Budget is a comprehensive financial plan presented annually by the Government of India, outlining its revenue and expenditure for the upcoming fiscal year. The fiscal year typically runs from April 1st to March 31st. The budget covers allocations across various sectors and ministries, aiming to address the country's socio-economic needs and support its development objectives.

For the fiscal years 2025-2026 the Union Budget reflects India's aspirations to emerge as one of the world's leading economies. Against the backdrop of significant global and domestic challenges, the budgets during these years likely focused on revitalizing the economy, fostering inclusive growth, and enhancing resilience.

Scenario 1:

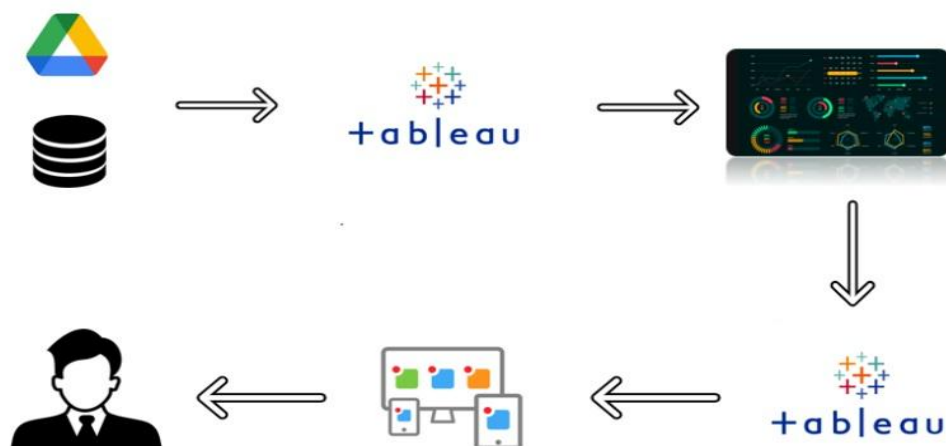
A tech startup specializing in renewable energy solutions wants to expand its operations and invest in research and development (R&D) to innovate new technologies. However, the company is concerned about funding constraints and wants to explore government support mechanisms.

Scenario 2:

A manufacturing company specializing in electric vehicles (EVs) aims to ramp up production and expand its EV product line. The company is interested in understanding government policies and incentives supporting the EV industry.

Scenario 3:

A prominent pharmaceutical company is poised to expand its healthcare portfolio by launching new drugs and therapeutic solutions. Recognizing the critical role of government policies and funding priorities in shaping the healthcare landscape, the company seeks to conduct a comprehensive analysis to inform its strategic decisions.



Project Flow

To accomplish this, we have to complete all the activities listed below,

Define Problem / Problem Understanding

- Specify the business problem
- Business requirements
- Literature Survey
- Social or Business Impact.

• Data Collection & Extraction from Database

- Collect the dataset,
- Storing Data in DB
- Perform SQL Operations
- Connect DB with Tableau

Data Preparation

- Prepare the Data for Visualization

Data Visualizations

- No of Unique Visualizations

Dashboard

- Responsive and Design of Dashboard

Story

- No of Scenes of Story

Performance Testing

- Amount of Data Rendered to DB ‘
- Utilization of Data Filters

No of Calculation Fields

No of Visualizations/ Graphs

Web Integration

- Dashboard and Story embed with UI With Flask

Project Demonstration & Documentation

- Record explanation Video for project end to end solution
- Project Documentation-Step by step project development procedure

Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Collect the dataset

Acquire the finalized dataset required for the Tableau project, ensuring it is clean, relevant, and aligned with the defined problem. Validate data integrity and readiness for analysis and visualization tasks.

Understanding the Data

Data contains all the meta information regarding the columns described in the CSV files.

Column Description of the Dataset:

- Index Category
- Index
- Ministry under Government of India
- Individual Scheme under which Fund is allocated
- Actual Revenue 25-26
- Actual Capital 25-26
- Total Budget 25-26
- Estimated Revenue 25-26
- Estimated Capital 25-26
- Total Budget 25-26
- Revised Estimates 2025-2026 Revenue
- Revised Estimates2025-2026 Capital
- Revised Estimates2025-2026 Total
- Budget Estimates2025-2026 Revenue
- Budget Estimates2025-2026 Capital
- Budget Estimates2025-2026 Total

Data Loading

Connecting data to Tableau means importing your saved dataset into the Tableau software, so you can start exploring, analyzing, and visualizing the information easily.

To begin, download the dataset from Kaggle and extract the files to a convenient location on your computer. Once the dataset is ready, open Tableau and connect to the data by selecting the appropriate file type—typically a CSV or Excel file. Navigate to the folder where the dataset was saved and import it into Tableau.

Once the data is loaded, spend a few minutes reviewing the data source tab. Check column headers, correct data types, and ensure there are no obvious issues like null values or formatting errors. You can also rename fields for clarity and begin creating calculated fields according to your choice.

Data Preparation

Clean, transform, and organize the connected data to ensure consistency and accuracy. Create calculated fields, handle null values, and structure the data appropriately for effective visualization and insightful analysis in Tableau.

Prepare the Data for Visualization

In this step, we prepare the dataset for visualization in Tableau. Although some preprocessing has already been completed, it's important to carry out additional steps to ensure the data is accurate, structured, and ready for analysis. You can explore the process in detail through the points below:

Data Review & Exploration

While the dataset is clean, it's good practice to explore it briefly—checking data types, value ranges, and distributions. This helps us understand the structure, identify any potential outliers, and gain familiarity with the data we'll be visualizing.

Filtering and Structuring for Purpose

Depending on the business question, we may still need to filter the data to focus on specific subsets—such as certain time periods, regions, or product categories. Structuring the data to match the visualization goal helps ensure relevance and clarity.

Field Renaming & Final Formatting

To enhance clarity in Tableau, we ensure field names are intuitive and consistent. We also check for proper data types (e.g., date fields, numeric values) and relationships if the dataset spans multiple tables.

Optional Calculated Fields

If needed, we can create calculated fields (as per need) to support deeper analysis. Even with a clean dataset, these additions can make our visualizations more insightful.

Validation for Accuracy

Lastly, a quick validation against the source or summary metrics ensures everything is accurate. This final step helps maintain trust in the insights generated.

Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyse the performance and efficiency of Radisson Hotels include bar charts, line charts, and heat maps, scatter plots, pie charts, Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables, breakdown of revenue and customer demographics, workload, resource allocation and location of hotels.

1.Top 5 Schemes 2025-2026

Defence (14.67%): Highest allocation at ₹7.85 lakh crore.

Interest Payments (25%): Major portion of revenue expenditure.

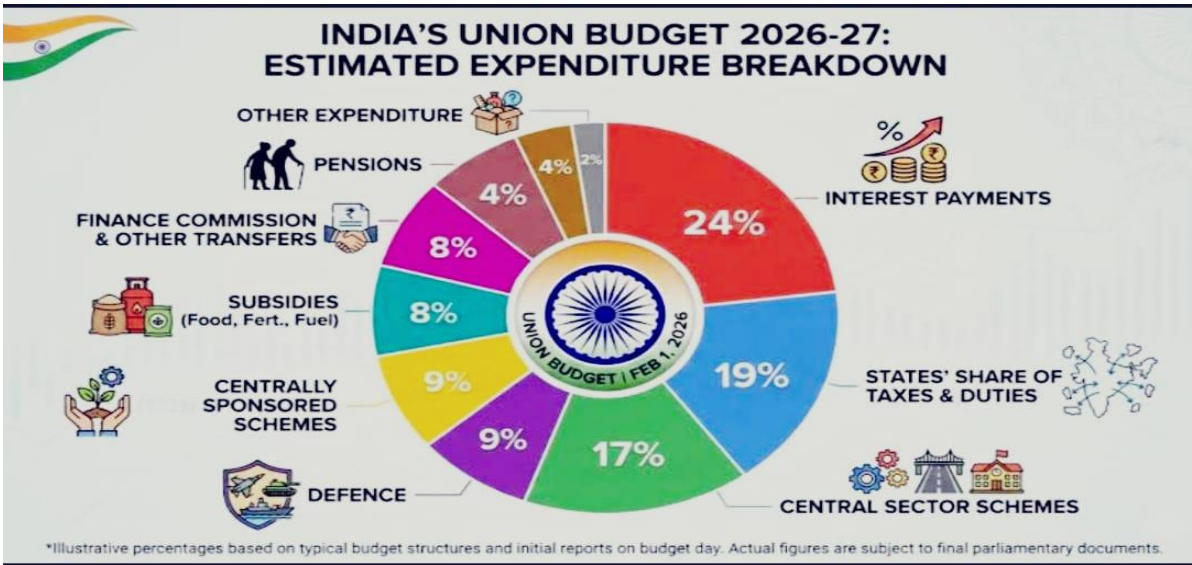
States' Share of Taxes & Duties (22%):

Central Sector Schemes: (17%)

Centrally Sponsored Schemes: (7%)

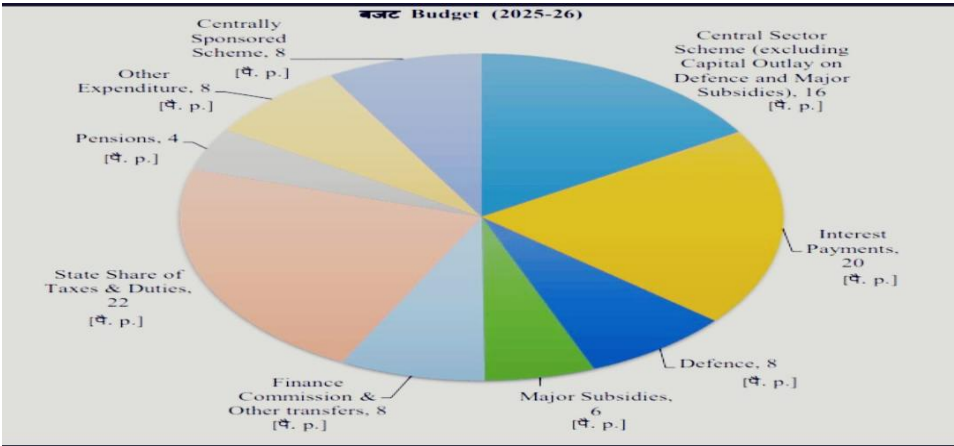
2.2026-2027 Budget Estimation

[Demo Link](#)



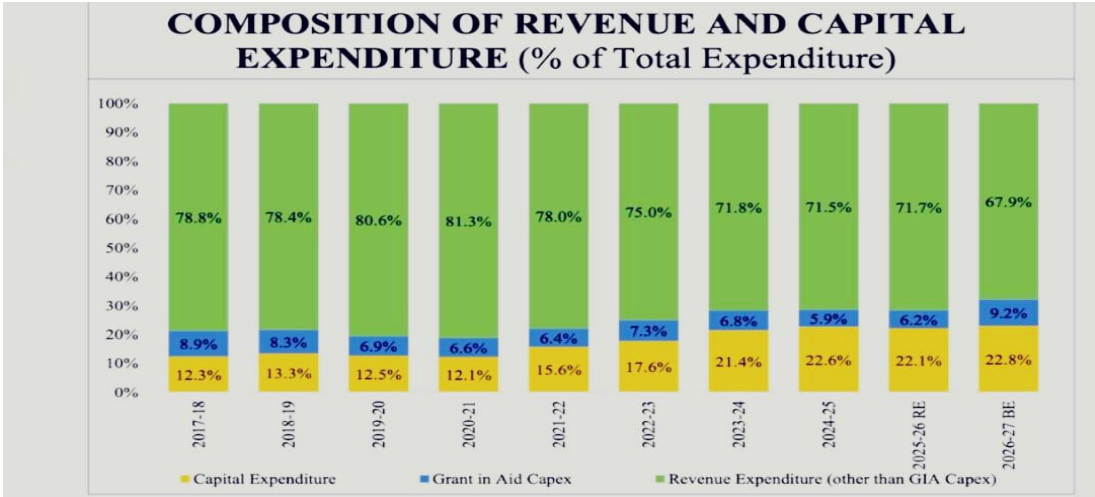
3.2025 – 2026– Budget Estimation – Department Wise

[Demo Link](#)



4.2017– 2027– Revenue-Capital-Estimation

[Demo Link](#)



5. Top 5 Ministry Wise for 2021-2025

[Demo Link](#)



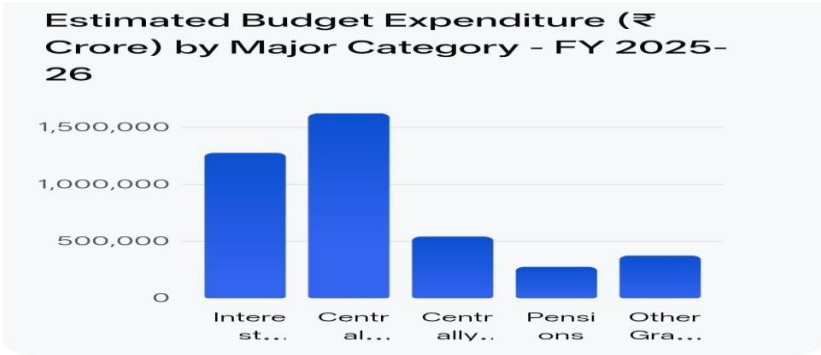
6.Total Amount Invested

[Demo Link](#)



7. Total Budget- Category Wise

[Demo Link](#)



For the fiscal year **2025-2026**, the Union Government of India estimated a total expenditure of **₹50.65 lakh crore**. This represents a **7.4% increase** over the revised estimates of the previous year. [PRSIIndia +1](#)

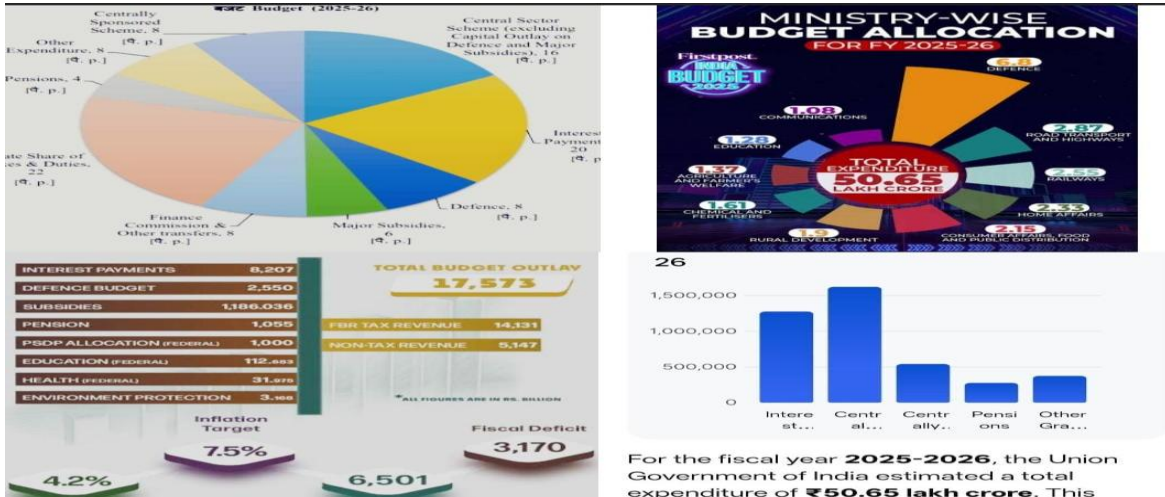
Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

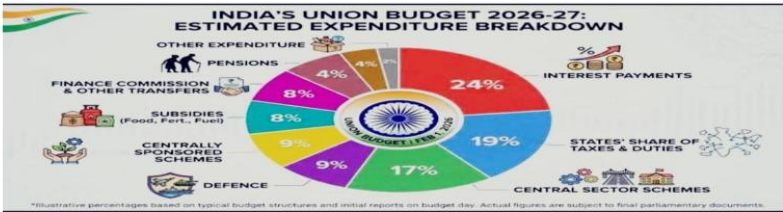
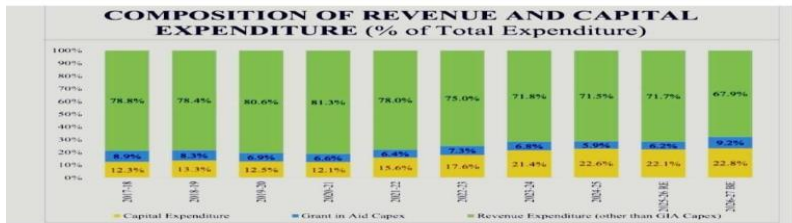
Responsive and Design of Dashboard

A responsive dashboard adapts to different screen sizes—desktop, tablet, or phone—so it looks good and is easy to use everywhere. Use flexible layouts, simplify visuals for small screens, keep fonts and colors clear, and test on multiple devices. This ensures everyone can view and interact with your data smoothly.

Dashboard 1:



Dashboard2:



Story

A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

No of Scenes of Story

In Tableau, a **Story** is a sequence of dashboards or sheets, called **Scenes**. Each Scene presents insights step-by-step, guiding users through data narratives, comparisons, and conclusions interactively

Performance Testing

Performance testing involves assessing the volume of data rendered from the database, the impact of data filters on system responsiveness, and the complexity introduced by the number of visualizations. Optimizing these factors ensures the dashboard operates efficiently, providing timely and reliable insights.

Amount of Data Loaded

Monitor the volume of data being pulled and rendered from the database to ensure queries are optimized and not overloading the system.

The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store and retrieve data.

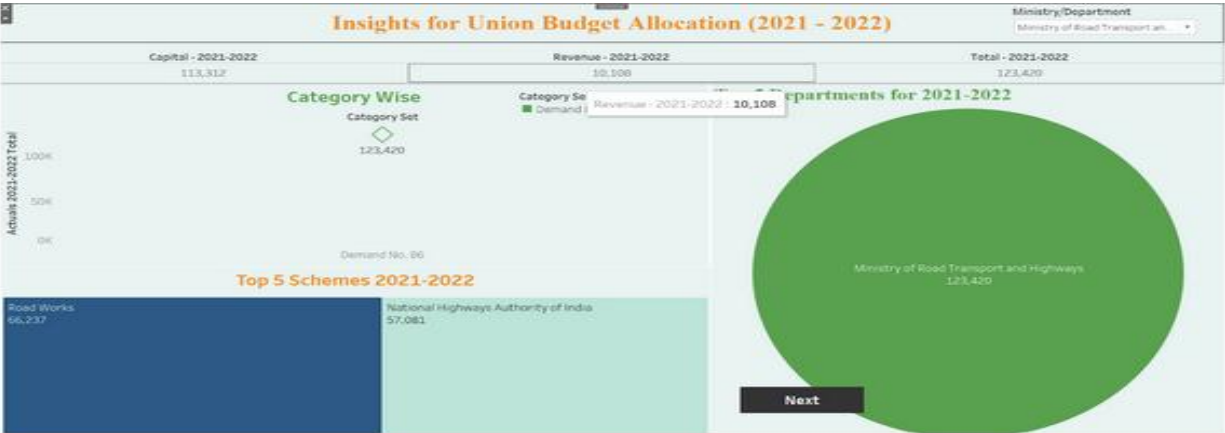
Open the MySQL Workbench, go to the database then click to expand the tables, select the table and click on (i) button to get the information related to table such as column count, table rows etc

| Type | Field Name | Phys... | Rem... |
|------|------------------------------|-----------|-----------|
| Abc | Category | Indian... | Categ... |
| # | SI.No. | Indian... | SI.No. |
| Abc | Ministry/Department | Indian... | Minist... |
| Abc | Scheme | Indian... | Scheme |
| # | Actuals 2021-2022 Revenue | Indian... | Actual... |
| # | Actuals 2021-2022 Capital | Indian... | Actual... |
| # | Actuals 2021-2022 Total | Indian... | Actual... |
| Abc | Budget Estimates 2022-202... | Indian... | Budge... |
| # | Budget Estimates 2022-202... | Indian... | Budge... |
| # | Budget Estimates 2022-202... | Indian... | Budge... |

| Type | Field Name | Phys... | Rem... |
|------|------------------------------|-----------|-----------|
| # | Actuals 2021-2022 Total | Indian... | Actual... |
| Abc | Budget Estimates 2022-202... | Indian... | Budge... |
| # | Budget Estimates 2022-202... | Indian... | Budge... |
| # | Budget Estimates 2022-202... | Indian... | Budge... |
| # | Revised Estimates2022-202... | Indian... | Revise... |
| # | Revised Estimates 2022-20... | Indian... | Revise... |
| # | Revised Estimates2022-202... | Indian... | Revise... |
| # | Budget Estimates2023-202... | Indian... | Budge... |
| # | Budget Estimates2023-202... | Indian... | Budge... |
| # | Budget Estimates2023-202... | Indian... | Budge... |

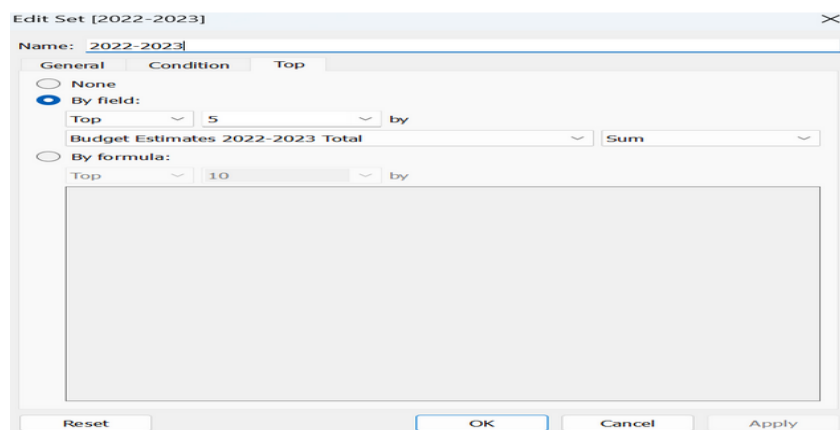
Utilization of Data Filters

Utilization of data filters refers to the effective implementation and management of filtering mechanisms within the Project to refine and focus the dataset. Proper use of filters enhances performance by limiting the volume of data processed and displayed, thereby improving responsiveness. It also enables users to interactively explore specific segments of data, leading to more targeted and meaningful insights.



No of Calculation Fields

A calculated field is like making your own custom column in Tableau. Instead of only using the dataset values as they are, you can create new values using formulas. Step-by-Step: Open Tableau and connect your dataset. In the Data pane (left side where all fields are listed), Right-click ? choose Create Calculated Field. A dialog box opens ? give it a Name Write your formula in the editor



No of Visualizations/ Graphs

Total Amount Invested
Total Budget- Category Wise
Top 5 Department/Ministry Wise for 2018-2027
Top 5 Schemes 2025-2026
2025 – 2026 – Budget Estimation – Category Wise
2025 – 2026 – Budget Estimation – Department Wise
2025 – 2026 – Budget Estimation – Scheme Wise

Web integration

Web integration of a Tableau Dashboard Story involves embedding interactive visualizations into a website or web application. This allows users to explore data insights directly within a web interface, enhancing accessibility and engagement. It supports real-time updates, user filtering, and seamless navigation for a dynamic data storytelling experience.

Publishing

Publishing helps us to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

Steps:

1. Prepare Your Dashboard or Story

Ensure your **dashboard or story** is complete and working as expected.
Clean up any unnecessary sheets or data to reduce file size.

2. Sign in to Tableau Public

In Tableau Desktop, go to **File > Save to Tableau Public**.
If you're not already signed in, a login window will appear.
Enter your **Tableau Public credentials** or sign up if you don't have an account.

3. Save and Publish

After logging in, you'll be prompted to **name your workbook**.
Click **Save** – Tableau will upload the workbook to your Tableau Public profile.

4. View Your Published Dashboard/Story

After uploading, your browser will open the published workbook on your **Tableau Public profile**.

Here you can:

- Share the link
- Embed it into a website
- Set the workbook to public or hidden

Dashboard and Story embed with UI with Flask

Using Flask, you can embed Tableau Dashboards and Stories within a web UI. With HTML, Bootstrap, and frame, users interact seamlessly with visualizations, enabling dynamic, responsive, and interactive data exploration.

```
index.html X temp.py X
1 |from flask import Flask, render_template
2
3 app = Flask(__name__)
4
5 @app.route('/')
6 def index():
7     return render_template('index.html')
8
9 if __name__ == '__main__':
10     app.run(debug=True,port=5000)
```



Clean Data from Excel, CSV, PDF, and Google Sheets with Data Interpreter

Applies to: Tableau Cloud, Tableau Desktop, Tableau Server

When you track data in Excel spreadsheets, you create them with the human interface in mind. To make your spreadsheets easy to read, you might include things like titles, stacked headers, notes, maybe empty rows and columns to add white space, and you probably have multiple tabs of data too.

When you want to analyze this data in Tableau, these aesthetically pleasing attributes make it very difficult for Tableau to interpret your data. That’s where Data Interpreter can help.

Tip: Though Tableau's Excel add-in is no longer supported, Data Interpreter can help you reshape your data for analysis in Tableau.

What does Data Interpreter do?

Data Interpreter can give you a head start when cleaning your data. It can detect things like titles, notes, footers, empty cells, and so on and bypass them to identify the actual fields and values in your data set.

It can even detect additional tables and sub-tables so that you can work with a subset of your data independently of the other data.

After Data Interpreter has done its magic, you can check its work to make sure it captured the data that you wanted and identified it correctly. Then, you can make any necessary adjustments.

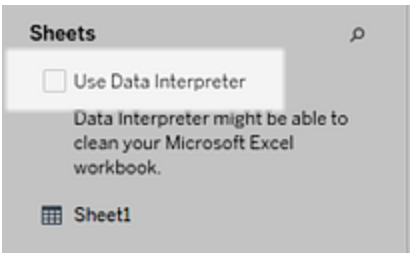
After you select the data that you want to work with, you might also need to do some additional cleaning steps like pivoting your data, splitting fields, or adding filters to get the data in the shape you want before starting your analysis.

Note: If your data needs more cleaning than what Data Interpreter can help you with, try [Tableau Prep](#)(Link opens in a new window).

Turn on Data Interpreter and review results

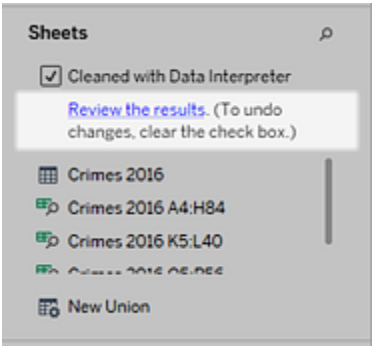
1. From the **Connect** pane, connect to an Excel spreadsheet or other connector that supports Data Interpreter such as Text (.csv) files, PDF files or Google sheets.

2. Drag a table to the canvas (if needed), then on the **Data Source** page, in the left pane, select the **Use Data Interpreter** check box to see if Data Interpreter can help clean up your data

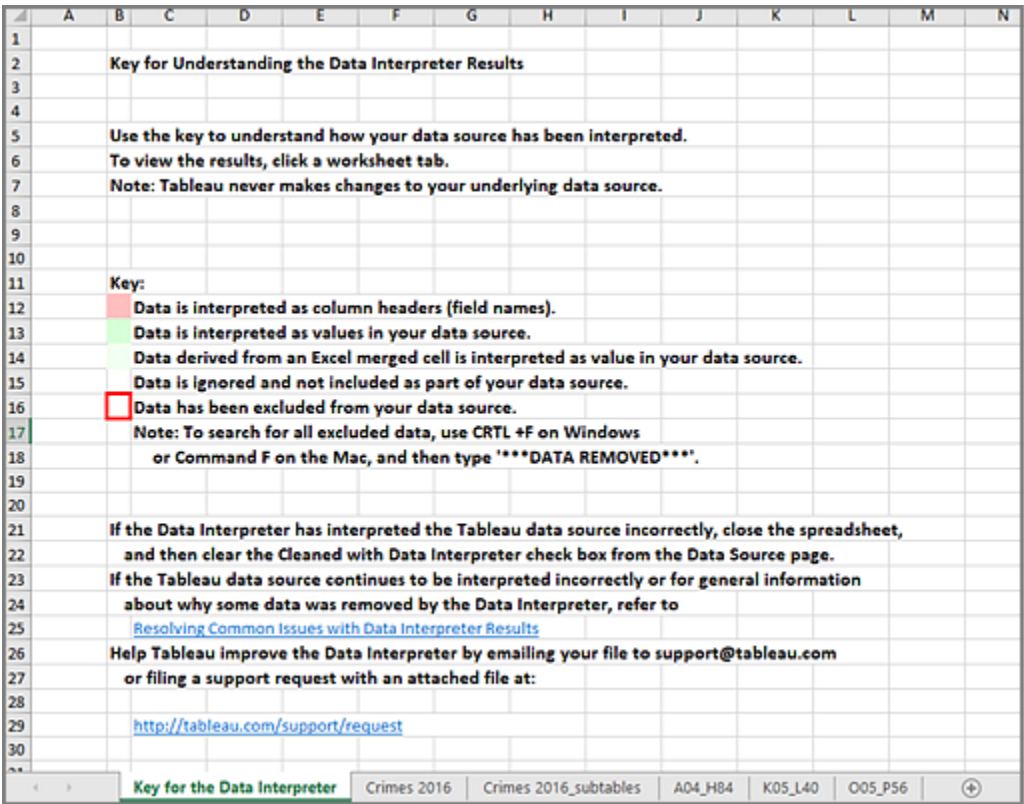


Note: When you clean your data with Data Interpreter, Data Interpreter cleans all the data associated with a connection in the data source. Data Interpreter does not change the underlying data.

3. In the Data pane, click the **Review the results** link to review the results of the Data Interpreter.



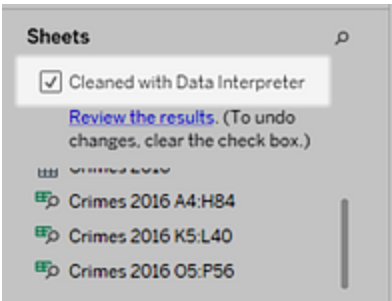
A copy of your data source opens in Excel on the **Key for the Data Interpreter** tab. Review the key to find out how to read the results.



4. Click each tab to review how Data Interpreter interpreted the data source.

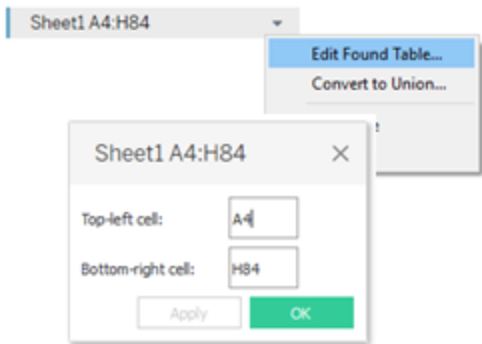
If Data Interpreter found additional tables, also called found tables or sub-tables, they are identified in the <sheet name>_subtables tab by outlining their cell ranges. A separate tab is also included for each sub-table, color coded to identify the header and data rows.

If Data Interpreter does not provide the expected results, clear the **Cleaned with Data Interpreter** check box to use the original data source.



5. To replace the current table with any of the found tables, drag the current table off the canvas and then drag the found table that you want to use to the canvas.

If Data interpreter has misidentified the range of the found table, after you drag the found table to the canvas, click the drop-down arrow on that table, and then select **Edit Found Table** to adjust the corners of the found table (the top-left cell and bottom-right cell of the table).



6. After you have the data that you want to work with, you can apply any additional cleaning operations to your data so that you can analyze it.

Data Interpreter Example

In this example we are connecting to an Excel spreadsheet with violent crime data by city and state for the year 2016. This spreadsheet includes multiple tables on one sheet and some extra formatting.

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|----|---|--------------|----------------|-----|-----|--------|-----|-----|-----|-----|----|---|---|---|---|---|---|
| 1 | Violent Crimes in 2016 in the United States by City and State | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | Location | | | | Months | | | | | | | | | | | |
| 5 | | city | state | Apr | Jun | Jul | Aug | Sep | Oct | | | | | | | | |
| 6 | | Albuquerque | New Mexico | | | | | | 46 | | | | | | | | |
| 7 | | Anaheim | California | | | 4 | | | | | | | | | | | |
| 8 | | Anchorage | Alaska | | 1 | | | | 26 | | | | | | | | |
| 9 | | Arlington | Texas | | | | | 17 | | | | | | | | | |
| 10 | | Atlanta | Georgia | | | | | | 85 | | | | | | | | |
| 11 | | Aurora | Colorado | | | | | | 16 | | | | | | | | |
| 12 | | Austin | Texas | | | | | 28 | | | | | | | | | |
| 13 | | Bakersfield | California | | | 22 | | | | | | | | | | | |
| 14 | | Baltimore | Maryland | | | | | | | 230 | | | | | | | |
| 15 | | Boston | Massachusetts | | | | | | 28 | | | | | | | | |
| 16 | | Buffalo | New York | | | | | | 38 | | | | | | | | |
| 17 | | Chandler | Arizona | | | | | | 3 | | | | | | | | |
| 18 | | Charlotte-M | North Carolina | | | 25 | | | | | | | | | | | |
| 19 | | Chicago | Illinois | | | | | | | 536 | | | | | | | |
| 20 | | Chula Vista | California | | 2 | | | | 1 | | | | | | | | |
| 21 | | Cincinnati | Ohio | | | | | | | 50 | | | | | | | |
| 22 | | Cleveland | Ohio | | | | | | | 89 | | | | | | | |
| 23 | | Colorado Sp | Colorado | | | | | | 15 | | | | | | | | |
| 24 | | Columbus | Ohio | | | | | | | 70 | | | | | | | |
| 25 | | Corpus Chris | Texas | | | 9 | | | | | | | | | | | |
| 26 | | Dallas | Texas | | | | | 118 | | | | | | | | | |
| 27 | | Denver | Colorado | | | | | 33 | | | | | | | | | |
| 28 | | Detroit | Michigan | | 5 | | | | | 221 | | | | | | | |
| 29 | | Durham | North Carolina | | | | | | | | 30 | | | | | | |
| 30 | | El Paso | Texas | | | | | | | 14 | | | | | | | |
| 31 | | Fort Wayne | Indiana | | | | | | | 34 | | | | | | | |
| 32 | | Fort Worth | Texas | | 7 | | | | 49 | | | | | | | | |
| 33 | | Fresno | California | | | | | 19 | | | | | | | | | |
| 34 | | Greensboro | North Carolina | | | | | | | | 20 | | | | | | |

| state | Total Crimes 2016 |
|---------------|-------------------|
| Alabama | 12 |
| Alaska | 26 |
| Arizona | 132 |
| California | 513 |
| Colorado | 64 |
| D.C. | 105 |
| Florida | 210 |
| Georgia | 85 |
| Hawaii | 9 |
| Illinois | 536 |
| Indiana | 151 |
| Kansas | 10 |
| Kentucky | 99 |
| Louisiana | 127 |
| Maryland | 230 |
| Massachuset | 28 |
| Michigan | 221 |
| Minnesota | 26 |
| Missouri | 223 |
| Nebraska | 29 |
| Nevada | 128 |
| New Jersey | 86 |
| New Mexico | 46 |
| New York | 290 |
| North Carolin | 82 |
| Ohio | 217 |
| Oklahoma | 82 |
| Oregon | 14 |
| Pennsylvania | 259 |

| State | Population 2016 |
|----------------|-----------------|
| Alabama | 4860545 |
| Alaska | 741522 |
| Arizona | 6908642 |
| Arkansas | 2988231 |
| California | 39296476 |
| Colorado | 5530105 |
| Connecticut | 3587685 |
| Delaware | 952698 |
| District of Co | 684336 |
| Florida | 20656589 |
| Georgia | 10313620 |
| Hawaii | 1428683 |
| Idaho | 1680026 |
| Illinois | 12835726 |
| Indiana | 6634007 |
| Iowa | 3130869 |
| Kansas | 2907731 |
| Kentucky | 4436113 |
| Louisiana | 4686157 |
| Maine | 1330232 |
| Maryland | 6024752 |
| Massachuset | 6823721 |
| Michigan | 9933445 |
| Minnesota | 5525050 |
| Mississippi | 2985415 |
| Missouri | 6091176 |
| Montana | 1038656 |
| Nebraska | 1907603 |
| Nevada | 2939254 |

- A. Title
- B. Merged header cells
- C. Extra white space
- D. Sub-tables

The extra formatting in this spreadsheet makes it difficult for Tableau to determine what the field headers and values are.

Instead, it reads the data vertically and assigns each column the default value F1, F2, F3 (Field 1, Field 2, Field 3) and so on. Blank cells are read as null values.

The next tab shows us the sub-tables that Data Interpreter found, outlined by the cell ranges.

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|----|---|----------------|--------|--------|--------|--------|--------|--------|-----|---|---|---|------------|-------------------|---|-------------|-----------------|
| 1 | Violent Crimes in 2016 In the United States by City and State | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | Location | Location | Months | Months | Months | Months | Months | Months | | | | | | | | | |
| 5 | city | state | Apr | Jun | Jul | Aug | Sep | Oct | | | | | state | Total Crimes 2016 | | State | Population 2016 |
| 6 | Albuquerque | New Mexico | | | | | | 46 | | | | | Alabama | 12 | | Alabama | 4860545 |
| 7 | Anaheim | California | | | 4 | | | | | | | | Alaska | 26 | | Alaska | 741522 |
| 8 | Anchorage | Alaska | 1 | | | | | 26 | | | | | Arizona | 132 | | Arizona | 6908642 |
| 9 | Arlington | Texas | | | | | 17 | | | | | | California | 515 | | Arkansas | 2988231 |
| 10 | Atlanta | Georgia | | | | | | 85 | | | | | Colorado | 64 | | California | 39296476 |
| 11 | Aurora | Colorado | | | | | | 16 | | | | | D.C. | 105 | | Colorado | 5530105 |
| 12 | Austin | Texas | | | | | 28 | | | | | | Florida | 210 | | Connectic | 3587685 |
| 13 | Bakersfiel | California | | 22 | | | | | | | | | Georgia | 85 | | Delaware | 952698 |
| 14 | Baltimore | Maryland | | | | | | | 230 | | | | Hawaii | 9 | | District of | 684336 |
| 15 | Boston | Massachusetts | | | | | | 28 | | | | | Illinois | 536 | | Florida | 20656589 |
| 16 | Buffalo | New York | | | | | | 38 | | | | | Indiana | 151 | | Georgia | 10313620 |
| 17 | Chandler | Arizona | | | | | | 3 | | | | | Kansas | 10 | | Hawaii | 1428683 |
| 18 | Charlotte | North Carolina | | 25 | | | | | | | | | Kentucky | 95 | | Idaho | 1680026 |
| 19 | Chicago | Illinois | | | | | | | 536 | | | | Louisiana | 127 | | Illinois | 12835726 |
| 20 | Chula Vist | California | 2 | | | | 1 | | | | | | Maryland | 230 | | Indiana | 6634007 |
| 21 | Cincinnati | Ohio | | | | | | 50 | | | | | Massachu | 28 | | Iowa | 3130869 |
| 22 | Cleveland | Ohio | | | | | | 89 | | | | | Michigan | 221 | | Kansas | 2907731 |
| 23 | Colorado | Colorado | | | | | 15 | | | | | | Minnesota | 26 | | Kentucky | 4436113 |
| 24 | Columbus | Ohio | | | | | | 70 | | | | | Missouri | 223 | | Louisiana | 4686157 |
| 25 | Corpus Ch | Texas | | 9 | | | | | | | | | Nebraska | 29 | | Maine | 1330232 |
| 26 | Dallas | Texas | | | | | 118 | | | | | | Nevada | 128 | | Maryland | 6024752 |
| 27 | Denver | Colorado | | | | | 33 | | | | | | New Jerse | 86 | | Massachu | 6823721 |
| 28 | Detroit | Michigan | 5 | | | | | 221 | | | | | New Mex | 46 | | Michigan | 9933445 |
| 29 | Durham | North Carolina | | | | | | | 30 | | | | New York | 290 | | Minnesot | 5525050 |
| 30 | El Paso | Texas | | | | | | 14 | | | | | North Car | 82 | | Mississipp | 2985415 |
| 31 | Fort Way | Indiana | | | | | | 34 | | | | | Ohio | 217 | | Missouri | 6091176 |

In this example the first sub-table, **Crimes 2016 A4:H84**, has the main data that we want to work with. To use this table as our data table, we can simply drag the original table off the canvas and then drag the new table to the canvas.

| <div> </div> <div> <div>Connections</div> <div> <div>crimes_2016</div> <div>Microsoft Excel</div> </div> </div> <div> <div>Sheets</div> <div> <div><input checked="" type="checkbox"/> Cleaned with Data Interpreter</div> <div>Review the results. (To undo changes, clear the check box.)</div> <div> <div>Crimes 2016</div> <div>Crimes 2016 A4:H84</div> <div>Crimes 2016 K5:L40</div> <div>Crimes 2016 O5:P56</div> <div>New Union</div> </div> </div> </div> | <div> <div>Crimes 2016 A4:H84 (crimes_2016)</div> <div> <div>Connection</div> <div> <div><input checked="" type="radio"/> Live</div> <div><input type="radio"/> Extract</div> </div> </div> <div> <div>Filters</div> <div>0 Add</div> </div> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------|----------------|------------|------------|------------|------------|------------|------------|-------------|------------|------|------|------|------|----|------|---------|------------|------|---|------|------|------|------|-----------|--------|---|------|------|------|----|------|-----------|-------|------|------|------|----|------|------|---------|---------|------|------|------|------|----|------|--------|----------|------|------|------|------|----|------|--------|-------|------|------|------|----|------|------|-------------|------------|------|----|------|------|------|------|-----------|----------|------|------|------|------|------|-----|--------|---------------|------|------|------|------|----|------|---------|----------|------|------|------|------|----|------|----------|---------|------|------|------|------|---|------|
| | <div> <div>Crimes 2016 A4:H84</div> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div> <div> <div>Sort fields</div> <div>Data source order</div> </div> <div> <div><input type="checkbox"/> Show aliases</div> <div><input type="checkbox"/> Show hidden fields</div> <div>79</div> <div>rows</div> </div> </div> <table> <tr> <th>Crimes 2016 A4:H84</th><th>Crimes 2016 A4:H84</th><th>Crimes 2016 A4:H84</th><th>Crimes 2016 A4:H84</th><th>Crimes 2016 A4:H84</th><th>Crimes 2016 A4:H84</th><th>Crimes 2016 A4:H84</th><th>Crimes 2016 A4:H84</th></tr> <tr> <th>Location city</th><th>Location state</th><th>Months Apr</th><th>Months Jun</th><th>Months Jul</th><th>Months Aug</th><th>Months Sep</th><th>Months Oct</th></tr> <tr> <td>Albuquerque</td><td>New Mexico</td><td>null</td><td>null</td><td>null</td><td>null</td><td>46</td><td>null</td></tr> <tr> <td>Anaheim</td><td>California</td><td>null</td><td>4</td><td>null</td><td>null</td><td>null</td><td>null</td></tr> <tr> <td>Anchorage</td><td>Alaska</td><td>1</td><td>null</td><td>null</td><td>null</td><td>26</td><td>null</td></tr> <tr> <td>Arlington</td><td>Texas</td><td>null</td><td>null</td><td>null</td><td>17</td><td>null</td><td>null</td></tr> <tr> <td>Atlanta</td><td>Georgia</td><td>null</td><td>null</td><td>null</td><td>null</td><td>85</td><td>null</td></tr> <tr> <td>Aurora</td><td>Colorado</td><td>null</td><td>null</td><td>null</td><td>null</td><td>16</td><td>null</td></tr> <tr> <td>Austin</td><td>Texas</td><td>null</td><td>null</td><td>null</td><td>28</td><td>null</td><td>null</td></tr> <tr> <td>Bakersfield</td><td>California</td><td>null</td><td>22</td><td>null</td><td>null</td><td>null</td><td>null</td></tr> <tr> <td>Baltimore</td><td>Maryland</td><td>null</td><td>null</td><td>null</td><td>null</td><td>null</td><td>230</td></tr> <tr> <td>Boston</td><td>Massachusetts</td><td>null</td><td>null</td><td>null</td><td>null</td><td>28</td><td>null</td></tr> <tr> <td>Buffalo</td><td>New York</td><td>null</td><td>null</td><td>null</td><td>null</td><td>38</td><td>null</td></tr> <tr> <td>Chandler</td><td>Arizona</td><td>null</td><td>null</td><td>null</td><td>null</td><td>3</td><td>null</td></tr> </table> | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Location city | Location state | Months Apr | Months Jun | Months Jul | Months Aug | Months Sep | Months Oct | Albuquerque | New Mexico | null | null | null | null | 46 | null | Anaheim | California | null | 4 | null | null | null | null | Anchorage | Alaska | 1 | null | null | null | 26 | null | Arlington | Texas | null | null | null | 17 | null | null | Atlanta | Georgia | null | null | null | null | 85 | null | Aurora | Colorado | null | null | null | null | 16 | null | Austin | Texas | null | null | null | 28 | null | null | Bakersfield | California | null | 22 | null | null | null | null | Baltimore | Maryland | null | null | null | null | null | 230 | Boston | Massachusetts | null | null | null | null | 28 | null | Buffalo | New York | null | null | null | null | 38 | null | Chandler | Arizona | null | null | null | null | 3 | null |
| Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | Crimes 2016 A4:H84 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location city | Location state | Months Apr | Months Jun | Months Jul | Months Aug | Months Sep | Months Oct | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Albuquerque | New Mexico | null | null | null | null | 46 | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Anaheim | California | null | 4 | null | null | null | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Anchorage | Alaska | 1 | null | null | null | 26 | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arlington | Texas | null | null | null | 17 | null | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Atlanta | Georgia | null | null | null | null | 85 | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aurora | Colorado | null | null | null | null | 16 | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Austin | Texas | null | null | null | 28 | null | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bakersfield | California | null | 22 | null | null | null | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Baltimore | Maryland | null | null | null | null | null | 230 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Boston | Massachusetts | null | null | null | null | 28 | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Buffalo | New York | null | null | null | null | 38 | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chandler | Arizona | null | null | null | null | 3 | null | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Once we have the data that we want to work with in the canvas, we can do some additional clean up on the data. For example we can:

- Change the field names so that they represent city, state, and month names.
- Pivot the months fields.
- Drag in the third sub-table **Crimes 2016 o5:P56** and join it to our first sub-table on the **State** field to include state populations for our analysis.
- Hide any duplicate fields that were added as a result of the join.

The results might look something like this:

| Sort fields Data source order | | | | |
|-------------------------------|-----------------------------|---------------------------------------|------------------------|----------------------|
| Crimes 2016 A4:HS4 City | Crimes 2016 A4:HS4 State | Crimes 2016 O5:P56 Population 2016 | Abc Pivot Months | # Pivot Crimes |
| Phoenix | Arizona | 6,908,642 | August | 111 |
| Pittsburgh | Pennsylvania | 12,787,085 | August | null |
| Plano | Texas | 27,904,862 | August | 5 |
| Portland | Oregon | 4,085,989 | August | null |
| Raleigh | North Carolina | 10,156,689 | August | null |
| Riverside | California | 39,296,476 | August | 7 |
| Sacramento | California | 39,296,476 | August | null |
| San Antonio | Texas | 27,904,862 | August | null |
| San Diego | California | 39,296,476 | August | 30 |
| San Francisco | California | 39,296,476 | August | null |
| San Jose | California | 39,296,476 | August | 35 |
| Santa Ana | California | 39,296,476 | August | null |
| Seattle | Washington | 7,280,934 | August | 14 |
| St. Louis | Missouri | 6,091,176 | August | 133 |
| St. Petersburg | Florida | 20,656,589 | August | 14 |

Now we are ready to start analyzing our data in Tableau.

When Data Interpreter is not available

The Data Interpreter option might not be available for the following reasons:

- **The data source is already in a format that Tableau can interpret:** If Tableau Desktop doesn't need extra help from Data Interpreter to handle unique formatting or extraneous information, the Data Interpreter option is not available.
- **Many rows or many columns:** The Data Interpreter option is not be available when your data has the following attributes:
 - Data contains more than 2000 columns.
 - Data contains more than 3000 rows and more than 150 columns.
- **The data source is not supported:** Data Interpreter is only available for Microsoft Excel, Text (.csv) files, PDF files and Google Sheets. For Excel, your data must be in the .xls or .xlsx format.

RESULTS:

Key for Understanding the Data Interpreter Results

Use the key to understand how your data source has been interpreted.
To view the results, click a worksheet tab.
Note: Tableau never makes changes to your underlying data source.

Key:

Data is interpreted as column headers (field names).

Data is interpreted as values in your data source.

Data derived from an Excel merged cell is interpreted as value in your data source.

Data is ignored and not included as part of your data source.

Data has been excluded from your data source.

Note: To search for all excluded data, use CTRL +F on Windows
or Command F on the Mac, and then type '***DATA REMOVED***'.

If the Data Interpreter has interpreted the Tableau data source incorrectly, close the spreadsheet,
and then clear the Cleaned with Data Interpreter check box from the Data Source page.
If the Tableau data source continues to be interpreted incorrectly or for general information
about why some data was removed by the Data Interpreter, refer to
[Resolving Common Issues with Data Interpreter Results](#)
Help Tableau improve the Data Interpreter by emailing your file to support@tableau.com
or filing a support request with an attached file at:
<http://tableau.com/support/request>

Key for Understanding the Data Interpreter Results

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Key:

Data is interpreted as column headers (field names).

Data is interpreted as values in your data source.

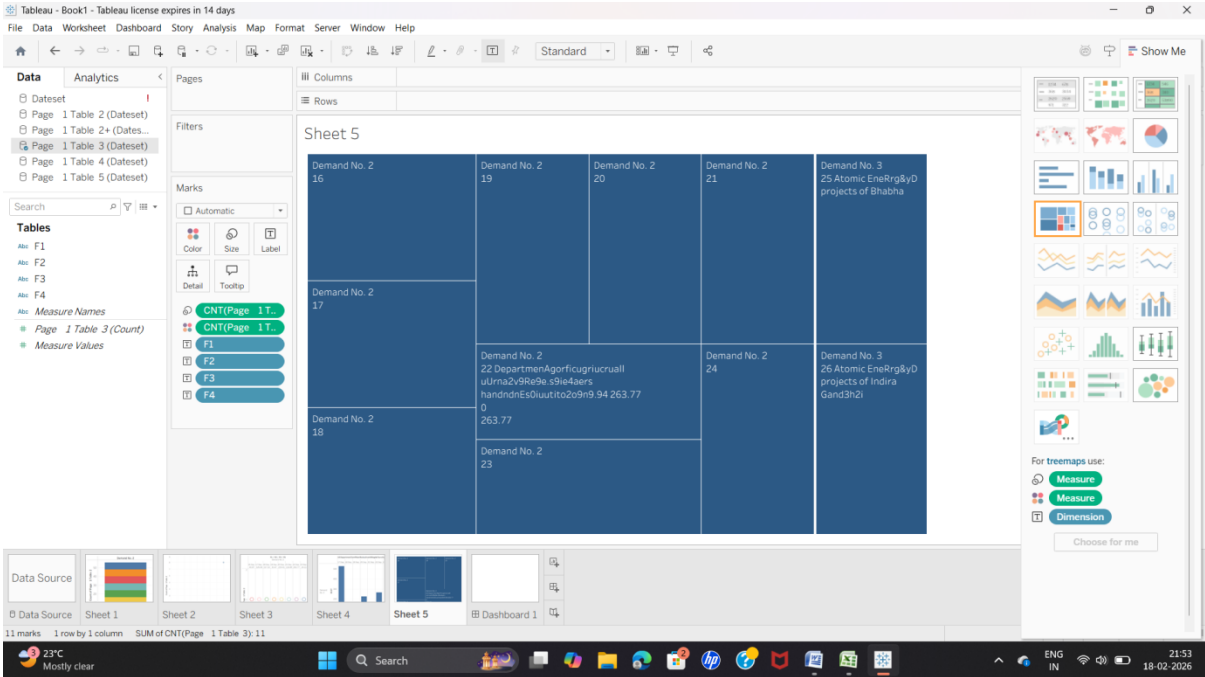
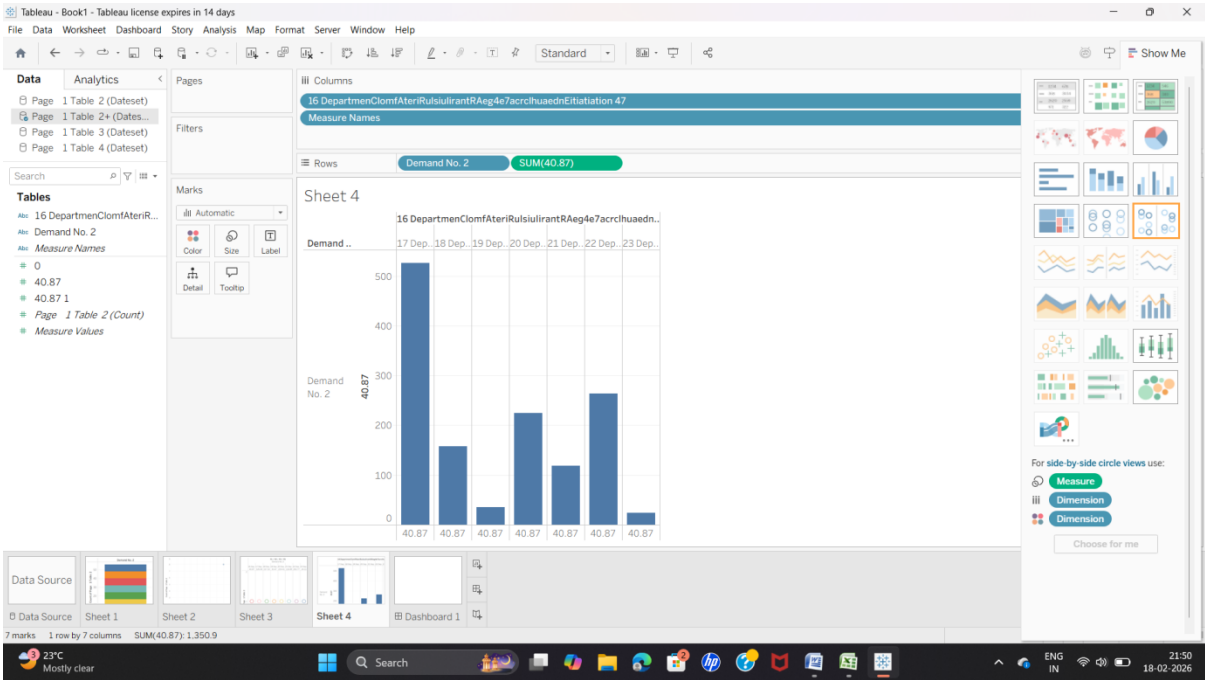
Data derived from an Excel merged cell is interpreted as value in your data source.

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[Resolving Common Issues with Data Interpreter Results](#)
Help Tableau improve the Data Interpreter by emailing your file to support@tableau.com
or filing a support request with an attached file at:
<http://tableau.com/support/request>



Project Demonstration & Documentation

Project Demonstration & Documentation involves presenting the project's functionality, features, and outcomes while providing clear written records, diagrams, and explanations to ensure understanding, usability, and reproducibility for stakeholders and future reference.

Below mentioned deliverables to be submitted along with other deliverables

Activity 1:- Record explanation Video for project end to end solution

Activity 2:- Project Documentation-Step by step project development procedure

Create document as per the template provided

GROUP PHOTO:



DEMO LINK:

https://drive.google.com/file/d/1YWvpY6XxUDhoMaJliq6zc0svnZ_36d9z/view?usp=drivesdk