

Tableau - Advanced Interview Questions

(Practice Project)



Basic

1. Summarise the differences between the data blending and the joining methods. Explain when and which would you prefer to use.

Answer :

Joining: Joining is executed within a single data source that contains multiple tables there. These tables can be joined together using a common key by using inner, left, right, or full outer join, which are similar to Sql queries.

Blending: Data blending is used when data comes from different data sources. Tableau blends data from multiple sources based on a common field. It's used when data from different databases needs to be combined without being moved into the same storage.

It is suitable when we have the data that cannot be combined immediately, such as when merging market data from an Excel sheet with sales data from a relational database.

2. In Tableau mention some of the key differences between a group and a set.

Answer :

Groups: In Tableau, we use groups to combine multiple members such as categories or dimensions into a single entity. They are mostly used for categorizing or simplifying data. Like – grouping several products into one category.

Sets: In Tableau, Sets are more dynamic and can be defined based on conditions or manual selections. It allows us to create subsets of data that can be used for filters, comparisons or calculations. Unlike groups, sets can change dynamically based on the underlying data.

3. Explain, What are the advantages of a dual-axis chart?

Answer :

Dual-axis charts allow you to compare two measures with different scales in one visualization, such as Sales and Profit, on the same time axis. This provides a direct comparison of how each measure behaves over time or against a dimension, making it easier to spot correlations or divergences.

4. What is a Gantt chart, In Which scenarios is it most ideal?

Answer :

Gantt Chart: A Gantt chart in Tableau is used to visualize project timelines or schedules, where each bar represents the duration of a task or event.

Scenarios: It's most useful in project management to track the start and end dates of tasks, monitor progress, and visualize dependencies between tasks. It's also helpful in resource management to see how resources are allocated over time.

5. Describe what is level of Detail (LOD) calculation and it's applications.

Answer :

LOD Calculation: LOD calculations in Tableau allow you to control the granularity of your data when performing calculations, independent of the view's context. There are three types: FIXED, INCLUDE, and EXCLUDE.

Use Cases: LOD calculations are used when you need to aggregate data at different levels of granularity than what is displayed in the view. For example, you might use an LOD calculation to calculate the total sales per customer, even if your view is aggregated at the region level.

6. In Tableau, What are hierarchies and how can they enhance data exploration?

Answer :

Hierarchies: Hierarchies in Tableau allow you to organize dimensions in a tree-like structure that facilitates drill-downs from a higher level of aggregation (like Region) to more granular levels (like Country and City).

Enhancement: Hierarchies make it easy to navigate through different levels of data, allowing users to explore trends at a summary level and then drill down into details as needed. This is particularly useful in reports that require analysis at multiple levels of detail.

7. Describe the objective of using parameters in Tableau.

Answer :

Parameters: Parameters are dynamic values that can be used to control various aspects of a Tableau visualization, such as calculations, filters, or display options. Unlike filters, which are limited to specific fields, parameters can be applied globally across the workbook.

Example: Parameters can be used in dashboards to allow users to switch between different metrics, such as Sales and Profit, with a single dropdown. This enhances interactivity and provides a more flexible analysis experience.

8. Using the Sample Data below, create a bin for the 'Sales' column with the bin size of 500. Also, Explain What insights you can derive from the resulting histogram.

Sample Data Snippet

A	B	C
Order ID	Product	Sales
1	A	450
2	B	900
3	C	1200
4	D	1500
5	E	600

Answer :

Step 1: Creating a Bin in Tableau

- Right-click on the 'Sales' field in the Data Pane.
- Select Create -> Bins..., and set the bin size to 500.
- The bins will be:
 - 0 - 500
 - 501 - 1000
 - 1001 - 1500
 - 1501 - 2000

Step 2: Insights from the Histogram

- **Sales Concentration:** The histogram will show that most sales fall within the 501 – 1500 range. Specifically:

- 0 – 500: 1 sale.
- 501 – 1000: 2 sales.
- 1001 – 1500: 2 sales.
- 1501 – 2000: 0 sales.

• Key Takeaways:

- Focus on products priced within 501 – 1500, as they have the highest frequency of sales.
- Consider strategies to boost sales in lower and higher ranges, as these have fewer or no sales.

This histogram helps identify where most sales occur, allowing the business to target key price ranges and optimize revenue strategies.

9. Using below data, create a group for products A, B, and C and use it to aggregate sales. Also explain, how this aggregation helps in analysis.

Sample Data Snippet

Order ID	Product	Sales
1	A	450
2	B	900
3	C	1200
4	B	300
5	A	500
6	B	700
7	C	1000
8	B	400
9	A	600
10	B	800
11	C	1100
12	C	350

Answer :

Step 1: First Create a Group –

- Group Products –
 - right click on the 'Product' field in the data pane.
 - Select Create -> Group.
 - In the dialog box inside, select products A, B, and C, and group them.
 - Put any Name for the group something like "ABC Group."

Step 2: Aggregate Sales Using the Group

- Drag the "ABC Group" field to the Rows shelf.
- Drag the 'Sales' field to the Columns shelf and set it to SUM to aggregate the sales for the group.

Step 3: Insights from Aggregation

- **Total Sales by Group:**

- By aggregating the sales of products A, B, and C, you can quickly see the total sales generated by these grouped products.

- **For this dataset:**

- Product A: $450 + 500 + 600 = 1550$
- Product B: $900 + 300 + 700 + 400 + 800 = 3100$
- Product C: $1200 + 1000 + 1100 + 350 = 3650$

Step 4: How This Aggregation Helps in Analysis

- Performance Comparison: Aggregating sales by the product group allows you to compare the total sales performance of different products at a higher level.
- Focus on Key Products: By grouping key products, you can quickly assess their combined impact on overall sales, helping in strategic decision-making, such as prioritizing inventory or marketing efforts.

Using groups in Tableau to aggregate sales enables a more streamlined analysis, making it easier to focus on key product performance and make data-driven business decisions.

10. Using the below sample data, create a dual axis chart showing Sales and Profit. Also explain which insights can be derived.

Sample Data Snippet

Month	Sales	Profit
Jan	5000	2000
Feb	7000	3000
Mar	6000	2500
Apr	8000	3500
May	7500	3200
Jun	8500	3800
Jul	9200	4000
Aug	7800	3400
Sep	8300	3700
Oct	8800	3900

Answer:

Step 1 - Steps to Creating a Dual-Axis Chart in Tableau

Load the Data: Import the sample data into Tableau.

Create the Dual axis Chart:

- Drag and drop the Month field to the Columns shelf.
- Drag and drop the Sales field to the Rows shelf.
- Now, drag the Profit field to the rows shelf again, to create a second axis.
- Now, On the second axis Profit, right-click and select dual axis.

Synchronize Axes:

- Right click on the axes and select Synchronize Axis to align the scales for better comparison.
- Now, Adjust the chart type for one of the measures (like Sales as bars and Profit as a line) to clearly express the difference between the two.

Step 2: Insights from the Dual-Axis Chart

Comparison of Trends -

- This dual axis chart allows us to compare the trend of Sales and Profit across the months within the same visual.
- Both Sales and Profit show an increasing trend from January to October.

Profitability Analysis -

- By visualizing both metrics together, we can see how closely Profit tracks with Sales. Here Sales increase, and Profit also increases, indicating a positive correlation.

Identify Key Months -

- The chart highlights particular months where the relationship between Sales and Profit might vary. For example:
 - In **July**, Sales peaked at 9200, with a Profit of 4000, appears that this month was particularly strong in both metrics.
 - The **dip in Sales** in March 600 also shows a lower Profit 2500, which needs further research.

The dual axis chart effectively displays the relationship between Sales and Profit over time. This visualization helps in identifying trends, correlations, and potential anomalies, enabling us with better business decisions regarding sales strategies and profit maximization.

11. Using the below Sample data, create a hierarchy for Region, State, and City. Also explain, how does this hierarchy helps in drilling down the data.

Sample Data Snippet

Region	State	City	Sales
East	NY	NYC	1000
East	NY	Buffalo	500
West	CA	LA	1200
East	NJ	Newark	800
West	CA	San Diego	900
East	MA	Boston	1100
South	TX	Houston	1300
South	FL	Miami	950
Midwest	IL	Chicago	1400
Midwest	OH	Cleveland	700

Answer :

Step 1 – Creating a Hierarchy in Tableau

Create the Hierarchy:

- In the Data Pane, drag the State field onto the Region field.
- Now, Drag the City field onto the State field.
- Now, Tableau will automatically create a hierarchy named Region or we can rename it.

The hierarchy structure will be:

- Region
- State
- City

Step 2 – How the Hierarchy Helps in Drilling Down the Data

Drill Down Analysis –

The hierarchy allows us to drill down from a broader view i.e Region to more detailed levels i.e State and City. For example, we can start by analyzing total sales by Region, then drill down to check how sales are distributed across States within a Region, and finally drill down to individual Cities.

Interactive Exploration –

When visualizing data, you can click on a Region to expand into States, and further into Cities. This interactive approach helps in uncovering insights that may be hidden at higher levels of aggregation.

Contextual Understanding –

By drilling down, you can understand how each level contributes to the overall sales performance. For instance:

- The East Region shows a strong performance in NY State, particularly in NYC.
- The West Region's sales are driven by LA and San Diego.
- The South Region's performance is bolstered by Houston.

In Tableau creating a hierarchy for Region, State, and City in Tableau allow us in efficient and dynamic data exploration. It allows for a top down analysis, helping us to find detailed insights and better understand the contributions of each geographic level to overall sales. This approach is useful for making strategic decisions based on regional performance.

Intermediate

12. Explain the difference between FIXED, INCLUDE, and EXCLUDE LOD calculations with examples.

Answer :

FIXED LOD Calculation: FIXED LOD calculations compute values using a specified dimension(s), regardless of the filters or other dimensions in the view.

Example: {FIXED [Region] : SUM([Sales])}

This calculation returns the sum of sales for each region, ignoring any other dimensions or filters applied to the view. If you filter by State, the sum of sales by Region remains constant.

INCLUDE LOD Calculation: INCLUDE LOD calculations compute values at the level of detail defined by the dimensions in the view plus the specified dimension(s).

Example: {INCLUDE [Product] : SUM([Sales])}

This calculation adds Product to the existing level of detail in the view. For instance, if your view is at the Category level, this will calculate the sum of sales at the Category + Product level, then aggregate it back up to Category.

EXCLUDE LOD Calculation: EXCLUDE LOD calculations remove the specified dimension(s) from the view's level of detail.

Example: {EXCLUDE [State] : SUM([Sales])}

If your view includes State and Region, this calculation removes State from the level of detail, calculating the sum of sales at the Region level instead of the State level.

Key Differences:

- FIXED: Ignores dimensions in the view that aren't specified in the calculation.
- INCLUDE: Adds dimensions to the view's level of detail.
- EXCLUDE: Removes specified dimensions from the view's level of detail.

13. Describe the benefits of using Tableau Prep for data cleaning and preparation.

Answer :

Tableau Prep is a powerful tool for cleaning, shaping, and combining data before analysis. Its key benefits include:

- **User-Friendly Interface:** The drag-and-drop interface is visual and intuitive, making data preparation accessible even for users with limited technical skills.
- **Efficient Data Cleaning:** Tasks like filtering, renaming, splitting, joining, and aggregating data are straightforward, helping to quickly resolve common data issues like null values and inconsistencies.
- **Data Integration:** Combine data from various sources, such as Excel, databases, and cloud services, to create a unified dataset for analysis.
- **Real-Time Feedback:** Tableau Prep provides immediate visual feedback on data changes, allowing for quick corrections and a better understanding of the data preparation process.
- **Reusable Workflows:** Save and reuse workflows for consistency in recurring data preparation tasks.
- **Seamless Integration with Tableau:** Works seamlessly with Tableau Desktop, enabling a smooth transition from data preparation to visualization and easy publishing to Tableau Server or Tableau Online.

14. Explain how role-based security works in Tableau Server. What are some best ways to implement it?

Answer :

Role-Based Security in Tableau Server allows administrators to control user access to content and features based on their assigned roles. Each role determines what a user can see and do within Tableau Server.

Roles Overview:

- **Server Administrator:** Full access to all server content and administrative functions. Can manage users, groups, settings, and all content.
- **Site Administrator:** Manages a specific site within Tableau Server. Can control users, groups, and content within that site but not across the entire server.
- **Publisher:** Can publish and manage workbooks and data sources. Can also create new content and control its permissions.
- **Explorer:** Can interact with and modify existing workbooks, create new ones from published data sources, and save views.
- **Viewer:** Has read-only access to content. Can view and interact with dashboards but cannot modify or create content.

Best Practices for Implementing Role-Based Security:

- **Define Roles Clearly:** Before assigning roles, ensure each role is clearly defined in terms of responsibilities and access requirements.
- **Use Groups:** Instead of assigning roles to individual users, create groups based on departments or job functions. This simplifies managing permissions.
- **Least Privilege Principle:** Assign the lowest level of access necessary for users to perform their jobs. Only grant higher permissions when absolutely needed.
- **Regularly Review Permissions:** Periodically review and update user roles and permissions to ensure they align with current needs.
- **Audit Access:** Utilize Tableau Server's built-in auditing tools to monitor who accesses what content, ensuring compliance with security policies.

Practical Questions:

Sample Data

Order ID	Region	Product	Category	Sales	Profit	Order Date	Ship Date	Customer Segment
1	East	Product A	Office	500	100	01-Jan-23	03-Jan-23	Corporate
2	West	Product B	Office	700	150	02-Jan-23	04-Jan-23	Small Business
3	North	Product C	Furniture	1200	200	05-Jan-23	07-Jan-23	Home Office
4	East	Product D	Office	300	50	06-Jan-23	08-Jan-23	Corporate
5	West	Product E	Technology	900	250	10-Jan-23	12-Jan-23	Consumer
6	South	Product F	Office	800	120	11-Jan-23	13-Jan-23	Small Business
7	North	Product G	Furniture	1100	180	15-Jan-23	17-Jan-23	Home Office
8	East	Product H	Technology	950	200	20-Jan-23	22-Jan-23	Consumer
9	West	Product I	Office	600	130	22-Jan-23	24-Jan-23	Corporate
10	South	Product J	Furniture	1000	220	25-Jan-23	27-Jan-23	Small Business

15. Using the data below, create a waterfall chart to show the contribution of each region to the total sales.

Answer :

Step

1. Load the Data: Import the data into Tableau.

2. Drag and Drop:

- Drag Region to the Columns shelf.
- Drag Sales to the Rows shelf.

3. Apply Running Total:

- Right-click Sales on the Rows shelf, select Quick Table Calculation, and choose Running Total.

4. Create Difference Calculation:

Create a calculated field Sales Difference with:

`ZN([Sales]) - LOOKUP(ZN([Sales]), -1)`

5. Adjust Mark Type:

- Change mark type to Gantt Bar and add Sales Difference to Rows.

6. Customize:

- Adjust colors and labels for clarity.

The chart shows how each region's sales contribute to the total, highlighting which regions increase or decrease the overall sales total.

16. Create a calculated field to categorize the sales into three categories: "Low" for Sales < 600, "Medium" for Sales between 600 and 900, and "High" for Sales > 900. Then, visualize the distribution of these categories across different regions.

Answer :

1. Create the Calculated Field:

Go to Analysis -> Create Calculated Field.

2. Name it Sales Category and use this formula:

```
IF [Sales] < 600 THEN "Low"
ELSEIF [Sales] <= 900 THEN "Medium"
ELSE "High"
END
```

3. Visualize the Distribution:

- Drag Region to the Columns shelf.
- Drag the Sales Category calculated field to the Rows shelf.
- Use a Bar Chart or Stacked Bar Chart to display the distribution.

Insights:

- This visualization shows how sales are categorized across regions, helping identify which regions have more low, medium, or high sales, aiding targeted strategies.

17. Using the data provided, create a dual-axis chart to compare the trend of Sales and Profit over the Order Date. What does the trend reveal? Attach the Visual snippet also.

Answer :

1. Create the Dual-Axis Chart:

- Drag Order Date to the Columns shelf.
- Drag Sales to the Rows shelf.
- Drag Profit to the same Rows shelf, creating a dual-axis chart.
- Synchronize axes if needed and adjust mark types (e.g., Line or Bar).

2. Trend Analysis:

- Sales and Profit trends can be compared over time, showing whether increases in sales align with increases in profit.

Insights:

- The dual-axis chart reveals how sales and profit trends correlate over time, indicating whether higher sales consistently lead to higher profit.

18. Create a set for the "Technology" category and use it to filter the view to show only the Sales and Profit for this category across different regions.

Answer :

1. Create the Set:

- Right-click on Category, choose Create -> Set.
- Name the set Technology Category and select only the "Technology" category.

2. Filter the View:

- Drag the Technology Category set to the Filters shelf.
- Drag Region to the Columns shelf.
- Drag Sales and Profit to the Rows shelf.

Insights:

- Filtering by the Technology category shows how sales and profit perform specifically in this category across regions, aiding in category-focused analysis.

19. Use the data to create a dynamic group for the "Office" category, where products with sales above 600 are grouped into "Top Performers" and others into "Standard." How does this grouping help in the analysis?

Answer :

1. Create the Dynamic Group:

Go to Analysis -> Create Calculated Field.
Name it Office Performance and use:

```
IF [Category] = "Office" THEN
  IF [Sales] > 600 THEN "Top Performers"
  ELSE "Standard"
END
END
```

20. Using the given data, create a waterfall chart to show how each product category contributes to the overall profit. What insights can this chart provide? Attach the Visual snippet also.

Answer :

1. Create the Waterfall Chart:

- Drag Category to the Columns shelf.
- Drag Profit to the Rows shelf.
- Apply Running Total on the Profit field.
- Create a calculated field for profit difference:
 $ZN([Profit]) - LOOKUP(ZN([Profit]), -1)$
- Change mark type to Gantt Bar and adjust to visualize profit changes.

2. Customize:

- Ensure proper color coding and labels to differentiate between categories.

Insights:

- The waterfall chart shows how each product category impacts the overall profit, highlighting which categories contribute most and least, aiding in performance analysis.

Advanced

21. What are some advanced techniques for designing interactive dashboards in Tableau?

Answer :

1. Dynamic Filters and Parameters:

- Use filters and parameters to allow users to interactively select data and control dashboard elements.

2. Dashboard Actions:

- Filter Actions: Sync data across different sheets.
- Highlight Actions: Emphasize related data points.
- URL Actions: Link to external resources.

3. Hierarchies and Drill-Downs:

- Enable users to explore data at various levels of detail.

4. Custom Calculations and Aggregations:

- Implement advanced calculations like LOD expressions for detailed metrics.

5. Interactive Dashboards with JavaScript API:

- Use Tableau's JavaScript API for advanced interactivity.

6. Responsive Design:

- Design dashboards to adapt to different screen sizes and devices.

7. Storytelling with Dashboards:

- Create dashboards that guide users through data insights.

23. What are the key considerations when exporting Tableau reports? How can you ensure the exported reports meet user requirements?

Answer :

1. Export Format and Purpose:

- Choose the right format (PDF, Excel, etc.) based on how the report will be used (printing, sharing, data manipulation).

2. Data Accuracy:

- Verify that the exported data accurately reflects the Tableau visualizations and calculations.

3. File Size and Performance:

- Optimize file size for efficiency; large datasets can slow down exports.

4. User Permissions:

- Ensure data security by controlling who can access the exported reports and protecting sensitive information.

5. Formatting and Layout:

- Maintain the visual layout and consistency of the original dashboard in the export.

6. Interactivity:

- Understand that interactive elements (filters, actions) may not be preserved in static formats like PDFs.

7. User Requirements:

- Collect user feedback to ensure the exported reports meet their needs and make necessary adjustments based on this input.

Scenario Based Practical Questions

23. Which chart type would you use to visualize the monthly trend of sales and profit across these regions? Explain your choice and the expected insights. Attach the Visual snippet also.

Sample Data

Month	Region	Sales	Profit
Jan	New York	5000	2000
Feb	Los Angeles	7000	3000
Mar	Chicago	6000	2500
Apr	Miami	8000	3500
May	Seattle	7500	3200
Jun	Boston	8500	3800
Jul	Dallas	9200	4000
Aug	Denver	7800	3400
Sep	Atlanta	8300	3700
Oct	Houston	8800	3900

Answer :
Explanation:

- Trend Analysis: A line chart effectively shows trends over time, making it ideal for displaying how sales and profit change each month.
- Comparison Across Regions: Multiple lines can represent different regions, allowing for easy comparison of trends between them.
- Clarity: The continuous nature of line charts helps in understanding the fluctuations and patterns over the months.

Expected Insights:

- 1. Trend Identification:** You can identify trends in sales and profit over time, such as periods of growth or decline.
- 2. Comparative Analysis:** Comparing lines for different regions will show which regions performed better or worse in terms of sales and profit.
- 3. Seasonal Patterns:** You can observe any seasonal effects or recurring patterns in sales and profit.

This approach will help in comprehending the overall performance trends and making strategic decisions based on the data.

24. How would you use nested LOD calculations to find the average profit per customer within each region and product category? Provide the calculation and explain the insights derived from this analysis. Attach the Visual snippet also.

Sample Data

Region	Category	Customer ID	Sales	Profit
New York	Furniture	C001	500	200
Los Angeles	Office	C002	700	300
Chicago	Technology	C003	900	400
Miami	Furniture	C004	600	250
Seattle	Office	C005	800	350
Boston	Technology	C006	1000	450
Dallas	Furniture	C007	1200	500
Denver	Office	C008	1100	480
Atlanta	Technology	C009	950	420
Houston	Furniture	C010	1050	490

Answer :

To find the average profit per customer within each region and product category using nested Level of Detail (LOD) calculations in Tableau, you can follow these steps:

Calculate Total Profit per Customer:

- First, calculate the total profit for each customer. This will help in aggregating profit data at the customer level.

Calculate Average Profit per Customer by Region and Category:

- Use nested LOD calculations to compute the average profit per customer within each combination of region and product category.

Calculations:

Total Profit per Customer:

{ FIXED [Customer ID]: SUM([Profit]) }

This calculation fixes the aggregation at the customer level, summing the total profit for each customer.

Average Profit per Customer by Region and Category:

{ FIXED [Region], [Category]: AVG({ FIXED [Customer ID]: SUM([Profit]) }) }

- The inner LOD { FIXED [Customer ID]: SUM([Profit]) } calculates the total profit for each customer.
- The outer LOD { FIXED [Region], [Category]: AVG(...) } calculates the average of these total profits within each combination of region and category.

Explanation and Insights:

1. Calculation of Profit per Customer:

- Total Profit per Customer: This shows how much profit each individual customer contributes.

2. Average Profit Analysis:

- Region and Category Breakdown: The nested LOD calculation provides the average profit per customer for each combination of region and product category.
- Insightful Comparison: This helps in understanding which regions and categories have higher average profits per customer, allowing for more targeted business strategies.
- Performance Measurement: Comparing average profits across different regions and categories can highlight areas with strong performance and those needing improvement.

25. Which advanced geographic map features would you use to highlight sales performance across different cities? Explain the visual choices and the expected insights. Attach the Visual snippet also.

Sample Data

City	Sales	Profit
New York	10000	4000
Los Angeles	8500	3500
Chicago	9000	3800
Miami	7000	3200
Seattle	7500	3300
Houston	8000	3400
Toronto	6500	3100
Vancouver	6000	2900
Calgary	7000	3100
Montreal	7500	3200

Answer :

To highlight sales performance across different cities effectively, you should use a filled map with color gradients in Tableau.

Visual Choice:

- Feature: A filled map where each city is shaded according to its sales volume.
- Color Gradient: Apply a color gradient to represent the range of sales values. Darker shades indicate higher sales, while lighter shades represent lower sales.

Step-by-Step Implementation:

1. Load Data: Import your city sales data into Tableau.

2. Create Map: Drag the City field to the map view to plot the cities on the geographic map.

3. Apply Color Gradient:

- Drag the Sales field to the Color shelf.
- Choose a color gradient that visually distinguishes between high and low sales, such as a gradient from light blue (low sales) to dark blue (high sales).

Expected Insights:

- Performance Visualization: The gradient will provide a clear visual representation of sales performance. Cities with higher sales will be depicted in darker colors, allowing you to easily identify top-performing cities.
- Sales Distribution: The map will highlight areas with high sales concentration and reveal regions with lower sales, helping you identify geographic patterns and trends.
- Strategic Focus: By visualizing sales performance geographically, you can make informed decisions about where to allocate resources or focus marketing efforts based on the observed sales distribution.

This approach allows you to quickly and effectively analyze sales performance across cities, facilitating better strategic decision-making.