# Comprehensive Answers — Tableau Visualizations, Data Connections, Blending, Joins, Dashboards, and Steps (All Questions)

Below are step-by-step instructions, best-practices, and short explanations to complete every requested task in Tableau. This document covers chart creation (Bar, Tree map, Area, Box-and-Whisker, Scatter, Histogram, Circle, Pie, Line, Bubble, Gantt, Bubble, Donut), data connections (MS Access, Google Sheets, CSV/Excel), calculated fields, data blending and cross-database joins, Sets, Groups, Dashboards including specific dashboards (Sample Superstore, Video Game Sales, Netflix, HR, COVID-19, Amazon Prime), and instructions on interactivity (filters, parameters, actions).

## Q1 — Create an interactive Bar chart and its variations in Tableau

Dataset: any table with categorical and numeric fields (e.g., Sample Superstore: Category, Sales, Profit).

Steps:

1. Open Tableau Desktop → Connect to your data source (Excel/CSV/Sample Superstore).

2. Drag the categorical field (e.g., Category or Sub-Category) to Columns and a numeric measure (e.g., Sales) to Rows.

3. To create horizontal bars: swap Rows/Columns or drag Category to Rows and Sales to Columns.

4. Sort bars descending by measure: click the sort icon on the axis or pill.

5. Add color: drag Profit to Color on Marks card to create a diverging color view.

6. Add labels: drag Sales to Label on Marks or click Show Mark Labels.

7. Create stacked bar: drag another dimension (e.g., Region) to Color (or to Columns to create side-by-side).

8. Variation — Bar with reference line: Analytics pane → drag Reference Line → choose SUM(Sales) to show average/target.

9. Variation — Bullet chart: create a measure for target and use dual-axis combining bars and Gantt or bar + reference line.

Interactivity:

- Add filters: drag Region or Year to Filters. Right-click → Show Filter to expose to dashboard.

- Use Highlight Actions: Dashboard → Actions → Add Highlight to let users hover to compare.

- Use Parameter to switch measure: create a parameter (e.g., Measure Selector: Sales, Profit), then a calculated field using CASE to return chosen measure and use it on Columns/Rows.

Tips: Use tooltips (Tooltip shelf) to show additional details, and set formatting to improve readability.

## Q2 — Connecting to a new data source in Tableau: types & when to use

General: On Tableau start page click 'Connect' → choose the connector type. For file-based connectors choose the file; for servers provide credentials.

Types & use-cases:

- Database server (MS Access example): Use for desktop database files or local .accdb/.mdb. Connect: Connect → More → Microsoft Access → browse to .accdb. Use when your data is stored locally in an Access DB, or when working with legacy desktop DBs.

- Cloud (Google Sheets): Connect → To a Server → Google Sheets (or Web connector). Sign in with Google and allow access, then choose the spreadsheet and sheet. Use when collaborating in the cloud or when the data is updated frequently and you want live refresh.

- File (CSV / Excel): Connect → Microsoft Excel or Text file. Use for static datasets, quick analysis, or when you were given a CSV/Excel export. Good for repeatable classroom tasks and fast prototyping.

Live vs Extract:

- Live connection: queries the data source each time; good for up-to-date dashboards but depends on source performance.

- Extract (recommended for large files): create an extract (.hyper) to improve performance and enable offline use. You can set extracts to refresh on schedule (Tableau Server/Online).

Create Calculated Field:

1. In Data pane → right-click → Create → Calculated Field.

2. Enter name and formula (e.g., Profit Ratio: SUM([Profit]) / SUM([Sales])).

3. Use LOD expressions when needed ({FIXED [Region]: SUM([Sales])}) and validate calculation.

Examples of calculations: IF [Sales] > 1000 THEN 'High' ELSE 'Low' END; DATEPARSE/DATE functions for date conversions.

## Q1 — Create interactive Tree Map in Tableau

Dataset: any categorical + numeric (e.g., Sample Superstore: Category/Sub-Category and Sales).

Steps:

1. Drag Category to Color and Sub-Category to Label (or Category to Rows then change Mark Type).

2. On Marks card change mark type to 'Treemap'.

3. Place Sales on Size and Profit on Color to create a size-color two-encode treemap.

4. Add Tooltip details and Show Filter for Category to allow user-driven filtering.

Interactivity: Use dashboard highlight and filter actions so selecting a treemap tile filters other sheets.

## Q2 — Data Blending vs Cross-Database Join in Tableau

Definitions:

- Data Blending: A logical join across different data sources at the worksheet level. Tableau maintains each data source separately and blends on a common field (link icon). Primary vs Secondary source: primary controls granularity.

- Cross-Database Join: Physical join executed by Tableau that combines tables from different connections into one logical table (introduced many years ago). Works when fields are compatible but keeps data in joined logical model.

When to use:

- Use Data Blending when sources cannot be combined directly (different levels of granularity, different databases where a live join isn't supported), or when you want to keep sources separate and blend on aggregated results.

- Use Cross-Database Join when you want Tableau to handle the join at row level and create a single combined datasource (easier for row-level analysis).

How to perform Data Blending (example: Coffee Chain Sales & Office City Sales — CSVs):

1. Connect to first CSV (Coffee Chain Sales) → drag into canvas → go to Sheet1 (this becomes primary).

2. Connect to second CSV (Office City Sales) using 'Add' connection → it appears in Data pane as another data source (secondary).

3. Ensure both datasets have a common field (e.g., City or Store ID).

4. On secondary data source, click the chain/link icon beside the field to link it to the primary source (link appears).

5. Drag fields from primary and secondary onto the view. Aggregations are driven by primary; blended fields from secondary are aggregated at the view-level.

Notes: Blending occurs at the aggregated level; you often need ATTR() or LODs to resolve mismatches.

Cross-Database Join (use CSV + Excel):

1. Connect to CSV and Excel in the same Tableau data source pane (Add connection).

2. Drag one table into the join area then drag the other table; Tableau will prompt to create a cross-database join.

3. Define join keys and type (inner, left, right, full).

4. Tableau executes the join and produces a combined logical table available as single source to the workbook.

Tips: Prefer cross-db joins for row-level analysis and blending when combining aggregated results or when sources have different grain.

## Q1 — Create interactive Area chart in Tableau

Dataset: time series with numerical values (e.g., Sales by Order Date).

Steps:

1. Drag Order Date to Columns (choose continuous month/year) and Sales to Rows.

2. On Marks card, change chart type to Area.

3. Add Category to Color to stack multiple area series by category or use Measure Names/Measure Values for multiple measures.

4. Add a parameter to let users choose date granularity (Year/Quarter/Month) and use it to control Order Date's granularity via calculated field.

Interactivity: Add range filter (Order Date) and use parameter-based dropdowns to change measure or aggregation.

## Q2 — Steps to Create Sets in Tableau and create views (Sample Superstore)

Create Sets:

1. Static Set: Right-click a dimension (e.g., Customer Name) → Create → Set → select specific members (top N or manual selection) → OK. This set won't change until edited.

2. Dynamic Set: Right-click dimension → Create → Set → Conditions or Top tab → choose Top by Field (Top 10 by Sales). The set updates as data changes.

Create Views using Sets:

1. Drag the Set to Filters to restrict view to set members, or to Color to show In/Out status.

2. Build visualization: e.g., drag Customer Name to Rows, SUM(Sales) to Columns, and the Set to Color to highlight selected customers.

Create a Group:

1. Right-click a dimension (e.g., Product Sub-Category) → Create → Group. Select members and click Group. Rename group and use it like a dimension.

2. Use Groups to combine small categories into 'Other' buckets to simplify charts.

Tips: Use sets in calculated fields (e.g., IF [Top Customers Set] THEN 'Top' ELSE 'Other' END).

## Q1 — Create interactive Box-and-Whisker Plot in Tableau

Dataset: numerical measure by categorical dimension (e.g., Sales by Region or Profit by Sub-Category).

Steps:

1. Drag Category/Sub-Category to Columns and Sales to Rows.

2. On Show Me choose 'Box-and-Whisker Plot' or on Marks choose 'Box-and-Whisker'.

3. To get one box per category: put Category on Columns and a measure like Profit on Rows, then Analytics pane → Box Plot.

4. Add dimension to Color to compare distributions across segments.

Interactivity: allow users to select categories via Filters or add parameter-driven reference lines for dynamic thresholds.

## Q2 — Create sheets and design an interactive Dashboard (Sample Superstore) — requirements

Required sheets (≥4): Bar chart (Profit by Category), Pie/Donut (Sales by Sub-Category or Region), Treemap (Sales & Profit by Category/Subcategory), Line (Sales over time by Category), Map (Discount by region).

Steps to build:

1. Build each worksheet separately (use appropriate marks: Bar, Pie, Treemap, Line, Map).

2. Use Filters: e.g., Order Date (year), Region, Category. Expose as 'Show Filter' to dashboard.

3. Create a dashboard: New Dashboard → set size (Floating or Fixed). Drag sheets onto canvas and arrange.

4. Add filters to dashboard by right-clicking a filter on a sheet → Apply to Worksheets → Selected Worksheets (or All Using This Data Source) to control which sheets respond.

5. Add Actions: Dashboard → Actions → Add Filter Action to allow clicking a bar to filter other views, or Highlight actions.

6. Add titles, descriptive text boxes, and format legends. Use Floating layout if you want free placement of KPI tiles.

7. For donut chart: create dual-axis with two pie charts (inner hole sized by a small circle) or create a pie and overlay a white circular shape.

8. Map for Discount by region: ensure geographic roles are assigned (State/Region) then drag Discount (AVG or SUM) to Color.

Tips: Keep dashboard responsive, limit marks for performance, and use extracts if data is large.

## Video Game Sales Dashboard (Kaggle dataset)

Connect: Download and connect to the videogamesales CSV file.

Sheets to create:

- Area Chart: Sales by Year and Genre — convert Year to continuous, drag Global_Sales to Rows and Year to Columns; add Genre to Color.

- Horizontal Bar: Top 10 names by sales — create Rank or use Top N filter (Create Set or filter Top by Sales) and sort descending; swap axes for horizontal layout.

- Bar chart: Total sales by Genre — Genre to Rows, SUM(Global_Sales) to Columns.

- Bubble chart: Top 10 platforms by Sales — Platform to Detail, SUM(Global_Sales) to Size, use Top N filter.

- Tree Map: Top 10 publishers by Sales — Publisher to Label & Color, Sales to Size, filter to Top 10.

- Text sheets: use COUNTD(Name) or COUNT(Name) etc. Create calculated fields: Total Names: COUNT([Name]) ; Total Platforms: COUNTD([Platform]) ; Total Publishers: COUNTD([Publisher]) ; Total Genres: COUNTD([Genre]). Display as KPI tiles on dashboard.

Dashboard: Set size width=1700, height=900 (Dashboard Size → Fixed → 1700x900). Arrange visualizations and add filters & actions.

## Scatter Plot & Netflix Dashboard (github dataset)

Scatter Plot steps:

1. Choose two continuous measures (e.g., Duration vs Year) or Ratings vs count to show relationships.

2. Drag measure1 to Columns, measure2 to Rows, set Marks to Circle, add Dimension to Detail or Color.

Netflix Dashboard steps (connect to provided CSV):

- Area Chart: Create count of Movies & TV shows by Year (use 'date_added' or 'release_year').

- Maps: Use 'country' field (assign geographic role) and count titles per country.

- Bar chart: Top 10 genres — 'listed_in' may contain multiple genres; split or use contains and group; use Top N or Rank filter to get top 10.

- Bubble chart: Use Genre or Type distribution with Size as count.

- Bar chart Ratings: COUNTD(show_id) by rating.

- Text sheets: create text table sheets showing Ratings, release_date, description, duration using TEXT shelf and formatting.

Dashboard Size: width=1800, height=1000 (Fixed). Add actions (Filter Actions) for interactivity.

## Histograms & Interactive HR Dashboard (HR dataset)

Histogram steps:

1. Use continuous numeric (e.g., Age) → drag Age to Columns, click Show Me → Histogram or create bins: right-click Age → Create → Bins (choose bin size).

HR Dashboard steps (connect HR dataset):

Worksheets to create:

- Employee Count: use COUNT([EmployeeID]) or COUNTD depending on uniqueness.

- Attrition Count: SUM(IF [Attrition]='Yes' THEN 1 ELSE 0 END) or COUNT(IF ... ).

- Attrition Rate: [Attrition Count] / [Employee Count] or use table calc.

- Active Employee: filter Attrition='No' and count.

- Average Age: AVG([Age]).

Visualizations:

- Department-wise Attrition (Pie): Department to Color, Attrition Count to Angle/Size.

- Employees by Age Group (Histogram): create Age bins and plot count.

- Education Field-wise Attrition (Bar): Education Field to Rows and Attrition Count to Columns.

- Job Satisfaction (Heat Map): Use JobSatisfaction and Department with Color indicating avg attrition or count.

- Attrition Rate by Gender & Age Groups: use small multiple pies or stacked bars with Gender then Age Bin.

Build Dashboard: arrange KPI tiles and charts, add filters (Department, Job Role, Age Bin), set filter actions and use 'Apply to Worksheets' selectively.

## Circle Chart & COVID-19 Dashboard (India dataset)

Circle Chart (also called Packed Bubbles):

1. Use Marks card → choose Circle and set dimension to Category and measure to Size to create packed circles view.

COVID Dashboard steps:

- Map Visualization: assign State to geographic Role (State), drag Total Deaths to Color or Size on map.

- Multiple Line Charts: create line charts for Confirmed, Recovered, Deceased over Date for the country or by State (use small multiples).

- Horizontal Bar Charts: ICMR Testing Labs by State — use count of labs by state and display as horizontal bars.

- Donut Charts: split Age & Gender distributions — create pies and convert to donut by adding a dual-axis white circle.

- Horizontal Stacked Bar Chart: Vaccination doses by category (Dose1, Dose2) stacked by state or age group.

- Dashboard: combine maps, lines, and KPIs; add filters for State, Date Range, and Vaccine Type; add parameter to toggle cumulative vs daily.

## Pie Chart & Hierarchy: roll-up, drill-down, slice (Sample Superstore)

Pie Chart steps:

1. Use Category or Region on Color, SUM(Sales) on Angle on a Pie mark.

2. For Donut: dual-axis with pie + inner circle placeholder.

Hierarchy and operations:

- Create hierarchy: in Data pane select Region → State → City and choose Create Hierarchy, name it (e.g., Geography).

- Roll-Up: in a view with the hierarchy, click the '+' / '-' controls or use pills to move to higher-level (Region) — roll-up aggregates to parent level.

- Drill-Down: expand the hierarchy to go from Region → State → City (click the '+' beside the dimension in the view or place hierarchy on Rows).

- Slice: use Filters to slice the data by specific criteria (e.g., Year=2020 or Category='Furniture').

## Line Chart & Amazon Prime Dashboard (amazon_prime_titles.csv)

Line Chart steps:

1. Connect to CSV; use 'date_added' or 'release_year' as X axis and COUNT(show_id) on Y for titles by year.

Amazon Prime Dashboard tasks (steps summarized):

- Create individual visualizations: Total Titles (KPI), Ratings (bar), Genres (bar), Directors (table or top N), Map for country with total shows, Pie chart for Movies vs TV Shows, Line chart for Titles by Release Year.

- Use filters for Country, Type (Movie/TV Show), Genre and set dashboard size and actions.

- Add interactivity via dashboard Actions (Filter / Highlight) and Parameters to change the metric shown.

## Bubble & Gantt charts

Bubble Chart:

1. Use two measures for axes and another measure for Size; change Marks → Circle; add labels and tooltips. Bubble charts are useful for showing three measures at once.

Gantt Chart:

1. Gantt requires a start date and a duration (or end date). Drag start date to Columns (continuous), Gantt bar on Marks, drag Duration to Size or use calculated Gantt length.

2. Often used for project timelines or scheduling visualizations.

## Final Tips, Interactivity Patterns, and Packaging

- Filters vs Parameters: Filters limit data; Parameters are single values that change behavior (e.g., top N, measure choice).

- Actions: Use Filter, Highlight, and URL actions to build interactivity between sheets on the dashboard.

- Performance: Use extracts for large datasets, minimize complex calculated fields on row-level, and use context filters for expensive filters.

- Exporting and sharing: After building dashboards you can 'Export' → 'PDF' from Tableau or publish to Tableau Server / Tableau Public for sharing.

- For exams: keep each worksheet titled, use consistent color palettes, and add a brief caption describing insight or action.

End of document. This file contains step-by-step instructions for all the tasks you listed. For reproducibility: follow the sequence: Connect → Clean/prepare data (create joins/blends/sets) → Build sheets → Combine on Dashboard → Add Actions and Parameters → Format and Export as PDF.