labs_summarised

Type	Note
Status	Completed

Lab Summaries (Simple Steps)

Here are the key takeaways and simplified steps for each lab:

Lab 1: Connecting to Data

- **Purpose:** Connect to various data sources, prepare data, and combine tables.
- **Key Features:** `Connect to File`, `Rename Fields`, `Geographic Roles`, `Joins`, `Blends`, `Unions`, `Merge Mismatched Fields`.
- **Task 1: Connect to an Excel File**
  1. `Launch Tableau > Connect To a File > More...` > Select `Sample - Superstore Subset (Excel)`.
  2. `Data Source Page > Rename Connection (top left) > Orders Data`.
  3. `Drag Orders sheet to "Drag sheets here" area`.
  4. `Rename Fields` (`Row` to `Row ID`, `Global Area` to `Country`).
  5. `Right-click Country > Geographic Role > Country/Region`.

- **Task 2: Change and Save a Data Source**
  1. `Launch Tableau > Connect To a File > Microsoft Excel` > Select `hurricane.xlsx`.
  2. `Drag Hurricane Data sheet to data area`.
  3. `Rename Lat (deg) to Latitude`, `Long (deg) to Longitude`.
  4. `Right-click Longitude > Geographic Role > Longitude`.
  5. `Drag Category (from Measures) to Dimensions`.
  6. `Right-click Category > Default Properties > Colour` > Assign colors (e.g., Category 4 brown, 5 gray).
  7. `Data tab > Right-click Hurricane Data > Add to Saved Data Sources`.
- **Task 3: Join Tables and Build a View**
  1. `Open join_tables_starter.twbx > Data Source tab`.
  2. `Drag Orders table to data area`.
  3. `Drag Returns table next to Orders (to join)`.
  4. `Edit Relationship dialog (if it doesn't open automatically, click the join icon) > Ensure conditions: CustomerID = CustomerID (Orders1) AND Product Sub-Category <> Product Sub-Category (Orders1)`.
  5. `Go to Sheet1`.
  6. `Drag Returns (Count) to Columns`, `Category to Rows`.
  7. `Click sort icon on axis > Descending`.
  8. `Fit box > Entire View`.
  9. `Rename Sheet to Orders Returned`.
- **Task 4: Blend Data from Two Sources**
  1. `Open blend_data_starter.twbx`.
  2. `Go to Orders worksheet`.
  3. `In Data pane > Select Orders data source`.
  4. `Drag Sales to Columns`, `Category to Rows`. (Notice blue checkmark on Orders data source).
  5. `In Data pane > Select Targets data source`. (Notice orange bar and checkmark).
  6. `Drag Quota to Sales axis (drop when two horizontal green bars appear)`.

7. `Repeat for Targets worksheet (Select Targets data source > Drag Quota to Columns, Category to Rows)`.
8. `On both worksheets: Drag Measure Names to Color (Marks card) > Edit Colors (Quota: different color from Sales)`.
9. `Bottom right null indicator > Show data at default position`.

- **Task 5: Union Data and Merge Fields**

1. `Open union_tables_starter.twbx > Data Source tab`.
2. `Drag Almonds table to data area`.
3. `Drag Hazelnuts table *below* Almonds until "Union" box appears`.
4. `Click down arrow on Almonds+ > Edit Union`.
5. `From left panel (Sheets), drag Macadamia, Pistachios, Walnuts into the Union window`. `OK`.
6. `In Metadata pane: Ctrl+click Yield per acre (pounds) and YPA in pounds`.
7. `Right-click one of them > Merge Mismatched Fields`.
8. `Double-click merged column header > Rename to Yield per acre (pounds)`.
9. `Rename Sheet column to Tree nut variety`.
10. `Go to Sheet1`.
11. `Drag Year to Columns`. `Drag Yield per acre (pounds) to Rows`.
12. `Drag Bearing acreage (acres) to Rows (left of Yield per acre)`.
13. `Drag Tree nut variety to Colour (Marks card)`.
14. `Fit box > Entire View`.

Lab 2: Visualizing Time Series Data

- **Purpose:** Display and analyze data over time, combining summary and detail.
- **Key Features:** `Duplicate Data Source`, `Dual Axis`, `Synchronize Axis`, `Date Filters`, `Date Formatting`.

- **Task 2: Summary and Detail Together**

1. `Open new sheet > Rename as Task 2`.
2. `Right-click Orders (Sample - Superstore Subset (Excel)) in Data Pane > Duplicate > Rename to Totals`.

3. In Data window, select Orders (Sample - Superstore Subset (Excel)).
4. Drag Order Date to Columns (YEAR). Drag Sales to Rows. Drag Customer Segment to Colour (Marks card).
5. Fit box > Entire View.
6. In Data window, select Totals data source.
7. Drag Sales to Rows. (You'll see two identical graphs).
8. On Marks card > Select the *second* SUM(Sales) > Drag Customer Segment out of Detail (to Remove). (Bottom graph becomes a single gray line).
9. Right-click Y axis of Totals chart > Dual Axis.
10. Right-click right Y axis > Synchronize Axis.
11. In Data window, select Orders data source. Drag Customer Segment to Filters > All > OK.
12. Right-click Customer Segment in Filters pane > Show Filter.

- **Task 3: Dates on Multiple Shelves**

1. Open new sheet > Rename as Task 3.
2. Drag Customer Segment to Columns, Order Date to Columns (YEAR).
3. Drag Sales to Rows.
4. Right-click YEAR(Order Date) on X axis > Format > Header tab > Default > Font > Bold. Close Format pane.
5. Right-click X axis > Rotate Label.
6. On Columns shelf: Click plus sign on YEAR(Order Date) (to show Quarter).
7. Drag QUARTER(Order Date) from Columns shelf to Rows shelf.
8. Drag Order Date to Filters > Week days > Select Sunday, Friday, Saturday > OK.
9. Drag Order Date to Colour (Marks card).
10. Right-click YEAR(Order Date) on Marks card > More > Weekday.

- **Task 4: View with Month Abbreviations**

1. Open new sheet > Rename as Task 4.
2. Drag Order Date to Columns (MONTH). Drag Sales to Rows.
3. Right-click MONTH(Order Date) on Columns shelf > Format.

4. `In Format window > Dates dropdown > Select Abbreviation` (or First Letter).

- **Task 5: Five Most Recent Days' Data**
  1. `Open new sheet > Rename as Task 5`.
  2. `Drag Order ID, Order Date, Customer Name to Rows`.
  3. `On Rows shelf: Click down arrow on YEAR(Order Date) > More > Custom > Detail > Month / Day / Year`.
  4. `Drag Sales to Text (Marks card)`.
  5. `Right-click Order Date in Data Pane > Create > Parameter...`
     - `Name: Latest Order`
     - `Data Type: Date`
     - `Allowable values: Range`
     - Check `Maximum value only` > `Copy max value to current value`.
     - `Add from Field > Order Date`. `OK`.
  6. `Analysis > Create Calculated Field`.
     - `Name: Days From Most Recent`
     - `Formula: DATEDIFF('day', [Order Date], [Latest Order])`
     - `OK`.
  7. `Drag Days From Most Recent to Filters`.
  8. `Filter Field dialog > Minimum > Next`.
  9. `Range of Values > Set Max: 5 > OK`.
  10. `Right-click MIN(Days From Most Recent) in Filters shelf > Show Filter`.

Lab 3: Visualising Proportions

- **Purpose:** Compare data across categories, add totals, find top N, and perform Pareto analysis.
- **Key Features:** `Stacked Bars`, `Reference Line for Totals`, `INDEX() for Top N`, `Pareto Analysis (Running Total, Percent of Total, Measure Names to Size)`.
- **Task 1: Creating Bar Charts** (Basic)
  1. `Open new sheet > Rename Task 1`.

2. `Drag Order Date to Columns (YEAR)`. `Drag Sales to Rows`.
3. `Marks card > Type dropdown > Bar`.
4. `Drag Ship Mode to Colour (Marks card)`.
5. `Drag Region to Rows (left of Sales)` (to create multiple axes).
6. `Drag Region to Filters > Clear Central, East, South (keep West) > OK`.

- **Task 2: Creating a Grouped Bar Chart**

1. `Open new sheet > Rename Task 2`.
2. `Analysis > Create Calculated Field`.
    - `Name: Region Position`
    - `Formula: CASE [Region] WHEN "Central" THEN 2 WHEN "East" THEN 2.5 WHEN "South" THEN 3 WHEN "West" THEN 3.5 ELSE 4 END`
    - `OK`.
3. `Drag Product > Category to Columns`.
4. `Right-click Region Position > Convert to Dimension`. `Right-click Region Position > Convert to Continuous`.
5. `Drag Region Position to Columns`.
6. `Drag Sales to Rows`.
7. `Marks card > Type dropdown > Bar`.
8. `Drag Region to Colour (Marks card)`.
9. `Marks card > Click Size > Drag slider right to widen bars`.
10. `Right-click X-axis > Edit Axis > Range: Fixed, Start: 1, End: 4.5 > OK`.
11. `Right-click X-axis > Show Header` (uncheck to hide).

- **Task 3: Adding Totals to Stacked Bars**

1. `Open new sheet > Rename Task 3`.
2. `Drag Product > Department to Columns`, `Region to Columns (right of Department)`.
3. `Drag Sales to Rows`. `Drag Region to Colour (Marks card)`.
4. `Drag Sales to Label (Marks card)`.
5. `Show Me > Stacked Bar Chart`.

6. `Add Reference Line (for totals): Right-click Y-axis > Add Reference Line...`
    - `Line Type: Line`
    - `Scope: Per Cell`
    - `Label: Value`
    - `Formatting: Line: None`
    - `OK`.
7. `Align Totals: Right-click any total on chart > Format > Format Reference Line pane > Reference Line Label > Horizontal: Middle icon`.

- **Task 4: Finding the Top N within a Category** (See Cheatsheet section 2 for detailed steps using `INDEX()`).
- **Task 5: Adding Multiple Labels to a Pie Chart**
    1. `Open new sheet > Rename Task 5`.
    2. `Ctrl+click Department and Sales in Data window`. `Show Me > Pie Chart`.
    3. `Drag Department to Label (Marks card)`.
    4. `Create Calculated Field`.
        - `Name: Gross Margin %`
        - `Formula: SUM([Profit])/SUM([Sales])`
        - `OK`.
    5. `Create Calculated Field`.
        - `Name: Order Count & Profit %`
        - `Formula: "Orders = " + STR(COUNT([Order ID])) + ", Profit = " + (STR(ROUND([Gross Margin %]*100,1)) + "%")`
        - `OK`.
    6. `Drag Order Count & Profit % to Label (Marks card)`.
    7. `Fit box > Entire View`.
- **Task 6: Using Pareto Analysis** (See Cheatsheet section 4 for detailed steps).

Lab 4: Visualising Distribution

- **Purpose:** Understand data distribution using summary statistics, bins, and box plots.
- **Key Features:** `Summary Card`, `Binning Measures`, `Box Plots`, `Population Pyramids`.
- **Task 1: Using a Summary Card**
  1. `Open new sheet > Rename Task 1`.
  2. `Drag Profit to Columns`, `Sales to Rows`.
  3. `Drag Category to Colour (Marks card)`. `Drag Region to Shape (Marks card)`.
  4. `Worksheet menu > Show Summary`. `Drag Summary Card to left of Category legend`.
  5. `Click dropdown on Summary Card > Add statistics like Standard Deviation, First/Third Quartile, Skewness, Excess Kurtosis`.
- **Task 2: Binning Measures** (See Cheatsheet section 3 for detailed steps).
- **Task 3: Build a Box Plot**
  1. `Open new sheet > Rename Task 3`.
  2. `Drag Segment to Columns`. `Drag Discount to Rows`. `Drag Region to Columns (right of Segment)`.
  3. `Show Me > Box-and-whisker plot`.
  4. `Drag Region from Marks card back to Columns (right of Segment)`. (This is crucial for seeing individual marks).
  5. `Analysis > Aggregate Measures` (uncheck to disaggregate data).
  6. `Click Swap button (on toolbar) to swap axes`.
  7. `Right-click bottom axis > Edit Reference Line...`
     - `Whiskers extend to: Data within 1.5 times the IQR`.
     - `Fill: (choose a color e.g., Orange)`.
     - `OK`.
  8. `Fit box > Entire View`.
- **Task 4: Creating a Population Pyramid**
  1. `Open new sheet > Rename Task 4`.
  2. `Connect to population excel file`.
  3. `Right-click Age in Data Pane > Create Bins... > Size of bins: 10 > OK`.

4. `Drag Age (bin) to Rows`.
5. `Create Calculated Field: Male Population`. `Formula: IF [Gender] = 1 THEN [ESTBASE2000] END`. `OK`.
6. `Create Calculated Field: Female Population`. `Formula: IF [Gender] = 2 THEN [ESTBASE2000] END`. `OK`.
7. `Drag Male Population to Columns`, `Female Population to Columns (right of Male Population)`.
8. `Right-click Gender > Convert to Dimension`. `Drag Gender to Colour (Marks card)`.
9. `Right-click Male Population axis > Edit Axis... > Check Reversed > OK`.
10. `Click sort icon on Age (bin) axis > Sort Ascending`.

Lab 5: Visualising Correlation

- **Purpose:** Explore relationships between measures and visualize control limits.
- **Key Features:** `Trend Lines (for Pearson Correlation)`, `Control Charts (Average + Std Dev Reference Lines)`, `Market Basket Analysis (Self-Join + Heatmap)`.
- **Task 1: Using Pearson Correlation to Make Prediction**
  1. `Open new sheet > Rename Task 1`.
  2. `Drag Profit to Columns`, `Sales to Rows`. `Drag Customer Name to Detail (Marks card)`.
  3. `Right-click anywhere in the view > Trend Lines > Show Trend Lines`.
  4. `Right-click anywhere in the view > Trend Lines > Describe Trend Model` (Look for R-squared value).
- **Task 2: Build a Control Chart**
  1. `Open new sheet > Rename Task 2`.
  2. `Drag Order Date to Columns (WEEK)`. `Drag Sales to Rows`.
  3. `Add Average Line: Right-click Sales axis > Add Reference Line... > Line Type: Line, Value: Average, Scope: Entire Table > OK`.
  4. `Add Control Limits: Right-click Sales axis > Add Reference Line... > Line Type: Distribution, Value: Standard Deviation, Factors: -3,3 > OK`. (You can set Fill as light gray).
- **Task 3: Create a Market Basket Analysis**
  1. `Connect to Sample - Superstore Subset (Excel)`. `Rename Data Source to Data Source for Task 3`.

2. `Data Source tab: Drag Orders to data sheet`.
3. `Double-click Orders table > Duplicate`.
4. `Drag the duplicated Orders table next to the original Orders table (for self-join)`.
5. `Click the join icon > Set Join Type: Inner Join`.
6. `Add Join Conditions: CustomerID = CustomerID (Orders1) AND Product Sub-Category <> Product Sub-Category (Orders1)`.
7. `Go to new sheet > Rename Task 3`.
8. `Drag Product Sub-Category to Columns`. `Drag Product Sub-Category (Orders1) to Rows`.
9. `Drag Orders (Count) to Text (Marks card)`. (This creates the table view).
10. `To create Heat Map: On Marks card > Drag Orders (Count) from Text to Colour`.
11. `Drag Orders (Count) again to Size (Marks card)`.
12. `Marks card > Type dropdown > Square`.
13. `Marks card > Click Size > Drag slider right to enlarge squares`.

- **Task 4: Analyse Survey Data**

1. `Connect to Survey Data excel file`.
2. `Open new sheet > Rename Task 4`.
3. `Drag Row to Rows`. `Drag Measure Names to Columns`.
4. `Drag Measure Names to Filters > Select Q1 1, Q1 2, Q1 3 only > OK`.
5. `Right-click Measure Values > Default Properties > Number Format > Number (Standard)`.
6. `Drag Measure Values to Text (Marks card)`.
7. `Rename Aliases: In Data Pane > Right-click Measure Names > Aliases... > Rename Q1 1 to Always, Q1 2 to Sometimes, Q1 3 to Never`.
8. `Reorder Headers: Drag the headers on the Columns shelf to your desired order (e.g., Always, Sometimes, Never)`.
9. `Heat Map: Marks card > Type dropdown > Square`.
10. `Drag Measure Values from Text to Size (Marks card)`.
11. `Drag Measure Values from Text to Colour (Marks card)`.

Lab 6: Visualising Multivariate Data

- **Purpose:** Display multiple variables effectively for comparison.
- **Key Features:** `Facets (Small Multiples)`, `Bullet Graphs`, `Heatmap Calendar`.
- **Task 1: Creating Facets**
  1. `Connect to Sample - CoffeeChain excel file`.
  2. `Open new sheet > Rename Task 1`.
  3. `Drag Market to Columns`. `Drag Product Type to Rows`.
  4. `Drag Profit to Rows (right of Product Type)`.
  5. `Drag Market to Color (Marks card)`.
- **Task 2: Creating Bullet Graphs**
  1. `Open new sheet > Rename Task 2`.
  2. `Ctrl+click Product Type, Market, Budget Sales, Sales in Data Pane`.
  3. `Show Me > Click Bullet Graph icon`.
  4. *Adjust if needed:* `Drag Product Type and Market pills on Rows shelf to get desired order (e.g., Market first, then Product Type)`.
  5. `Right-click X-axis (Budget Sales axis) > Swap Reference Line Fields`.
- **Task 3: Creating a Heatmap Calendar**
  1. `Connect to Accidents_2015 excel file`.
  2. `Open new sheet > Rename Task 3`.
  3. `Drag Date to Columns (WEEKDAY)`. `Drag Date to Rows (WEEK NUMBER)`.
  4. `Fit box > Entire Width`.
  5. `Drag Accidents_2015 (Count) to Color (Marks card)`.
  6. `Edit Colors: Marks card > Color > Edit Colors > Orange-Blue Diverging`. Check `Reversed`.
  7. `Drag Date to Label (Marks card)`. `Right-click YEAR(Date) on Marks card > Day`.
  8. `Click Text (Marks card) > Font size: 6, Vertical Alignment: Top`.
  9. `Create Calculated Field: Col Index`.
     - `Formula: CASE MONTH([Date]) WHEN 1 THEN 1 WHEN 2 THEN 2 ... END` (for 3 months per column group, follow the pattern in the lab).
     - `OK`.

10. `Drag Col Index (from Measures) to Dimensions`. `Drag Col Index to Columns (before Weekday)`.
11. `Create Calculated Field: Row Index`.
    - `Formula: DATEPART('week', [Date]) - { FIXED DATEPART('month', [Date]):MIN(DATEPART('week', [Date]))}`
    - `OK`.
12. `Drag Row Index (from Measures) to Dimensions`. `Replace WEEK NUMBER on Rows with Row Index`.
13. `Drag Date to Rows (before Row Index)`. `Right-click YEAR(Date) on Columns > Quarter`.
14. `Hide Headers: Right-click Quarter axis > Uncheck Show Header`. `Repeat for Row Index and Col Index`.
15. `Format Borders: Right-click chart > Format > Borders > Rows tab > Row Divider: thick white line`.
16. `Format Dates (Header): Right-click on any day in the chart > Format > Dates: Abbreviation`. `Change font size to 6 and bold`.
17. `Rename Sheet: Vehicle Accidents (2015)`.
18. `Connect to public_holiday_2015 Excel file`.
19. `Data > Edit Relationships... > Custom > Add > Select Date (Accidents_2015) and Date (public_holiday_2015) > OK`.
20. `Click the linking icon next to Date in the public_holiday_2015 data source to enable blending`.
21. `Drag Holiday to Label (Marks card)`. `Adjust font size if needed`.

Lab 7: Visualising Geospatial Data

- **Purpose:** Create map views, combine mark types on maps, and use bar charts in tooltips.
- **Key Features:** `Geographic Roles`, `Filled Maps`, `Dual Axis Maps`, `Pie Charts on Maps`, `Calculated Fields for Tooltips`.
- **Task 1: Mapping Basics**
  1. `Connect to Sample - Superstore Subset (Excel)`.
  2. `Open new sheet > Rename Task 1`.
  3. `Double-click State in Data Pane`. (Tableau automatically adds Long/Lat to Columns/Rows).
  4. `Drag Postal Code to Detail (Marks card)`.

5. Manually Assign Geographic Role: Right-click Postal Code > Geographic Role > Zip Code/Postcode.

- **Task 2: Filled Maps with Pie Chart**
  1. Open new sheet > Rename Task 2.
  2. Click State in Data Pane > Show Me > Filled Map.
  3. Drag Profit to Color (Marks card).
  4. Drag another instance of Latitude (generated) to Rows shelf.
  5. Right-click the *second* Latitude (generated) on Rows shelf > Dual Axis.
  6. On Marks card > Select the *second* Latitude (generated).
  7. Marks card > Type dropdown > Pie.
  8. Drag Sales to Size (Marks card). Drag Department to Color (Marks card).
  9. Marks card > Click Size > Use slider to enlarge pie charts.
- **Task 3: Bar Charts in Tooltips**
  1. Connect to Sample - Coffee Chain (csv).
  2. Open new sheet > Rename Task 3.
  3. Double-click State. Drag Actuals > Sales to Size (Marks card). Drag Actuals > Profit to Color (Marks card).
  4. **Create Cohort Calculations for Products:**
     - Analysis > Create Calculated Field.
     - Name: Coffee Sales. Formula: IF [Product Type]="Coffee" Then [Sales] END. OK.
     - Repeat for Espresso Sales, Herbal Tea Sales, Tea Sales.
  5. **Create Hashed Bar Calculations for Tooltips:**
     - Analysis > Create Calculated Field.
     - Name: % coffee lines.
     - Formula: LEFT("||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||",ROUND((SUM([Coffee Sales])/SUM([Sales]))*100,0)). OK.
     - Repeat for % espresso lines, % herbal tea lines, % tea lines.
  6. Drag all "% lines" calculated fields to Tooltip (Marks card).
  7. Worksheet > Tooltip...

    - Position cursor where you want the bars.
    - Click `Insert` > Select each of the `AGG(%...)` fields you created.
    - Format labels as desired (e.g., "Coffee Sales:"). `OK`.
8. `Mouse over states on map to view tooltips`.

- **Task 4: Creating Singapore Map**
    1. `Connect to Singapore dataset.xlsx`.
    2. `Open new sheet > Rename Task 4`.
    3. `Drag longitude to Columns`. `Drag latitude to Rows`.
    4. `Drag Town to Detail (Marks card)`.
    5. `Drag Population to Size (Marks card)`.
    6. *To Do:* Add more towns (manually update Excel), right-click data source > `Refresh`. Enhance tooltips as learned in Task 3.

Lab 8: Visualising Text and Document

- **Purpose:** Create and refine word clouds.
- **Key Features:** `Word Clouds`, `Filtering by Word Count`, `Data Blending for Stopwords`.
- **Task 1: Build a Word Cloud**
    1. `Connect to movies.xls`.
    2. `Open new sheet > Rename Task 1`.
    3. `Drag Title to Text (Marks card)`.
    4. `Drag Domestic Gross to Size (Marks card)`.
    5. `Drag Domestic Gross to Color (Marks card)`.
    6. `Marks card > Color > Edit Colors... > Select Sunrise-Sunset Diverging palette`.
    7. `Select Stepped Color > Steps: 12 > OK`.
    8. `Marks card > Type dropdown > Text`.
    9. *Optional:* Change title, background color etc.
- **Task 2: Remove common words from word cloud**
    1. `Connect to Lyrics Word Count.xls`.

2. `Open new sheet > Rename Task 2`.
3. `Drag Word to Text (Marks card)`.
4. `Drag Word Count to Size (Marks card)`.
5. `Drag Word Count to Color (Marks card)`.
6. `Marks card > Color > Edit Colors... > Select Red-Blue Diverging palette`.
7. `Select Stepped Color > Steps: 9 > OK`.
8. `Marks card > Type dropdown > Text`.
9. `Drag Word Count to Filters > All values > Next > At Least > Set Min: 1 > OK`.
10. `Right-click SUM(Word Count) in Filters shelf > Show Filter`.
11. `Connect to common_words excel file (stopwords)`.
12. `Data > Edit Blend Relationships... > Add > Map Word (from Lyrics Word Count) to words (from stopwords) > OK`.
13. `Click the linking icon next to Word in Lyrics Word Count data source to activate blending`.
14. `Create Parameter: Words to be excluded`.
    - `Data Type: Integer`, `Range: Min 0, Max 100`. `OK`.
15. `Right-click Words to be excluded in Parameters pane > Show Parameter Control`.
16. `Drag Rank (from stopwords) to Filters`.
17. `Filter Field dialog > Condition tab > By Formula: MIN([Rank]) > [Words to be excluded] > OK`.
18. Adjust `Words to be excluded` parameter to filter common words.

Lab 9: Create an Effective Dashboard & Storytelling

- **Purpose:** Combine multiple views into interactive dashboards and present findings as a story.
- **Key Features:** `New Dashboard`, `Use as Filter`, `Filter Actions`, `Go to URL Actions`, `New Story`, `Story Points`, `Story Formatting`.
- **Task 1: Build an Interactive Dashboard**
  1. `Open dashboard_starter.twbx`.
  2. `Click New Dashboard icon` (bottom of workspace).
  3. `Dashboard pane > Check Show dashboard title > Type "Sales Dashboard"`.

4. `Drag Sales by Segment worksheet onto dashboard`.
5. `Drag Plots of Sales to right of Sales by Segment`.
6. `Drag Sales by Region below both`. (Look for gray bar for placement).
7. `Adjust Fit: Select Sales by Segment > Fit > Entire View`. Repeat for others.
8. `Remove Sales Legend: Select gray Sales legend > Click X`.
9. `Apply Filter to All Worksheets: Select Region filter > Dropdown arrow > Apply to Worksheets > All Using This Data Source`.
10. `Set a View as Filter: Select Sales by Segment view > Click Use As Filter icon` (funnel icon on title bar).
11. `Test filters by clicking segments/regions`.

- **Task 2: Add Actions to Dashboard**
  1. `Open action_dashboard_starter.twbx`.
  2. `New Dashboard icon > Name "2014 Sochi Olympics Results"`.
  3. `Size dropdown > Width: 900px, Height: 600px`. `Check Show dashboard title`.
  4. `Drag Medals by Country to dashboard`.
  5. `Right-click Medals by Country title > Edit Title... > Add "Click a country" below title, font size 10 > OK`.
  6. `Dashboard pane > Objects > Drag Vertical layout container to right half of dashboard`.
  7. `Drag Total Medals by Sport into vertical container`. `Drag Medals by Athlete into vertical container (below Total Medals by Sport)`.
  8. `Filter Action (Map Filter): Dashboard > Actions... > Add Action > Filter`.
     - `Name: Map Filter`
     - `Source Sheets: Medals by Country`
     - `Run action on: Select`
     - `Target Sheets: Select all available sheets`
     - `Clearing the selection will: Exclude all values`
     - `OK`.
  9. `Filter Action (Filter by Athletes): Dashboard > Actions... > Add Action > Filter`.
     - `Name: Filter by Athletes`

- `Source Sheets: Total Medals by Sport`
- `Run action on: Select`
- `Target Sheets: Medals by Athlete`
- `Clearing the selection will: Exclude all values`
- `OK`.

10. `Test actions`.
11. `Adjust Fits: Select Total Medals by Sport view > Fit > Entire View`. `Select Medals by Athlete view > Fit > Fit Width`.
12. `Edit Titles: Right-click Total Medals by Sport title > Edit Title... > <Sheet Name> for <Country>`. `Right-click Medals by Athlete title > Edit Title... > <Sheet Name> <Sport>`.
13. `URL Action (Look up <Sport>): Dashboard > Actions... > Add Action > Go to URL`.
    - `Name: Look up information about <Sport>`
    - `Source Sheets: Medals by Athlete, Total Medals by Sport`
    - `Run action on: Menu`
    - `URL: <http://en.wikipedia.org/wiki/><Sport>` (Use `Insert` for `<Sport>`). `OK`.
14. `URL Action (Look up <Athlete>): Dashboard > Actions... > Add Action > Go to URL`.
    - `Name: Look up information about <Athlete>`
    - `Source Sheets: Medals by Athlete`
    - `Run action on: Menu`
    - `URL: <http://www.google.com/search?q="<Athlete>"+Olympics` > (Use `Insert` for `<Athlete>`). `URL Options: URL Encode Data Values`. `OK`.
15. `Test all actions`.

- **Task 3: Creating a Story**
  1. `Open story_starter.twbx`.
  2. `Click New Story icon` (bottom of workspace).
  3. `Story Size: Bottom left Size Bar > Story size dropdown > Letter Landscape (1100 × 850)`.
  4. `Edit Story Title: Double-click title at top > "What is Happening with Tables in the East?" > OK`.
  5. `Apply Global Story Formatting: Format menu > Story...`

- Navigator Shading: (choose color)
- Text Objects Shading: (choose color, 85%)
- Text Objects Border: None . Close Format Story pane .

6. Add Story Point 1 (Customer Purchases): Click Blank button (Story pane) .
7. Drag Customers Purchases worksheet to view .
8. Add a caption > Type "No profitable transactions for Tables in the East." .
9. In Side Bar: Drag Drag to add text to top right area .
10. Enter description text: "The sales of tables in the East is the highest however it's not making a profit. In fact, the higher the sale, the greater the profit loss." .
11. Align text: Click Left margin align button . OK . Adjust text box size .
12. Add Story Point 2 (Average Discount): Click Blank button .
13. Drag Average Discount worksheet to view .
14. Add a caption > Type "Comparing average Discount by Category." .
15. In Side Bar: Drag Drag to add text to top right area .
16. Enter description text: "Sales of Tables are given deep discounts." . OK . Adjust text box size .
17. Adjust Story Point Position: Click and drag navigator button (bottom) for "Comparing average Discount by Category" to third position .
18. Click Presentation Mode icon (top toolbar) or F7 to view story.

Lab 10: Using Parameters

- **Purpose:** Create dynamic visualizations controlled by user input.
- **Key Features:** String Parameters , Dynamic Axis Titles , Conditional Coloring with Parameters , Dynamic Chart Types .
- **Task 1: Creating String Parameters with Dynamic Title and Axis Labels**
  1. Connect to Sample - Superstore Subset (Excel) .
  2. Open new sheet > Rename Task 1 .
  3. Create Parameter: Right-click empty space in Data Pane > Create Parameter...
     - Name: Choose Measure
     - Data Type: String

    - `Allowable values: List`
    - `Add two entries: Value: 'Sales', Display As: 'Sales' AND Value: 'Profit', Display As: 'Profit'`.
    - `OK`.
4. `Right-click Choose Measure in Parameters pane > Show Parameter Control`.
5. `Create Calculated Field: Analysis > Create Calculated Field`.
    - `Name: Choose Measure Calc`
    - `Formula: CASE [Choose Measure] WHEN 'Sales' THEN SUM([Sales]) WHEN 'Profit' THEN SUM([Profit]) END`
    - `OK`.
6. `Drag Region to Columns`. `Drag Choose Measure Calc to Rows`.
7. `Test parameter control (right side)`.
8. `Dynamic Axis Label: Double-click Y axis label area`.
9. `Axis Titles: Erase any text (make blank)`.
10. `Drag Choose Measure (Parameter) to Rows shelf (to the right of AGG(Choose Measure) pill)`.
11. `Right-click the new Y axis title (Choose Measure) > Format... > Alignment: Up, Font: Black, Bold`.
12. `Right-click the Choose Measure pill on Rows shelf > Hide Field Labels for Rows`.
13. `Dynamic Chart Title: Double-click chart title area`.
14. `Edit Title dialog: "Sales by <Parameters.Choose Measure>"`. (Use `Insert` button to select `Parameters.Choose Measure`). `OK`.

- **Task 2: Using Parameters to change Colors**
    1. `Open new sheet > Rename Task 2`.
    2. `Create Parameter: Right-click empty space in Data Pane > Create Parameter...`
        - `Name: Above Target Parameter`
        - `Data Type: Float`
        - `Current Value: 600000`
        - `Allowable values: Range, Min: 0, Max: 1200000, Step size: 10000`.
        - `OK`.
    3. `Right-click Above Target Parameter in Parameters pane > Show Parameter Control`.

4. `Create Calculated Field: Analysis > Create Calculated Field`.
    - `Name: Above Target Calculation`
    - `Formula: SUM([Sales]) > [Above Target Parameter]`
    - `OK`.
5. `Drag Product > Category to Rows`. `Drag Sales to Columns`.
6. `Drag Above Target Calculation to Color (Marks card)`.
7. `Marks card > Color > Edit Colors... > Set False to Gray, True to Orange > OK`.
8. `Add Reference Line: Right-click Sales axis > Add Reference Line... > Line Type: Line, Value: Above Target Parameter (Parameters) > OK`.

- **Task 3: Change Chart Type of a Single Chart using Parameter**

1. `Open new sheet > Rename Task 3`.
2. `Create Parameter: Right-click empty space in Data Pane > Create Parameter...`
    - `Name: Viz Type`
    - `Data Type: String`
    - `Allowable values: List`
    - `Add two entries: Value: 'Bar', Display As: 'Bar' AND Value: 'Line', Display As: 'Line'`.
    - `OK`.
3. `Right-click Viz Type in Parameters pane > Show Parameter Control`.
4. `Create Calculated Field: Analysis > Create Calculated Field`.
    - `Name: Sales Bar`
    - `Formula: IIF([Viz Type]='Bar',[Sales],null)`
    - `OK`.
5. `Create Calculated Field: Analysis > Create Calculated Field`.
    - `Name: Sales Line`
    - `Formula: IIF([Viz Type]='Line',[Sales],null)`
    - `OK`.
6. `Drag Order Date to Columns (MONTH)`.
7. `Drag Sales Bar to Rows`. `Marks card > Type dropdown > Bar`.

8. `Format Month Abbreviations: Right-click MONTH(Order Date) on Columns > Format > Dates: Abbreviation`.
9. `Drag Sales Line to Rows (right of Sales Bar)`.
10. `Right-click Sales Line pill on Rows shelf > Dual Axis`.
11. `Right-click right Sales Line axis > Synchronize Axis`.
12. `Marks card > Select ALL > Remove Measure Names from Color`.
13. `Marks card > Select SUM(Sales Line) (specific mark card) > Type dropdown > Line`.
14. `Test Viz Type parameter control`.

▼ measures and stuff

Cheatsheet for Common Measures & Techniques

This section will be your go-to for quick lookups during the test.

1. Creating Calculated Fields (General Syntax)

- **Purpose:** To create new data based on existing fields.
- **Basic Structure:**
  - `[Field Name] + [Another Field]` (e.g., `[Sales] - [Profit]`)
  - `IF [Condition] THEN [Result1] ELSE [Result2] END`
  - `CASE [Field] WHEN 'Value1' THEN [Result1] WHEN 'Value2' THEN [Result2] END`

2. Top N Filter (Crucial for "Top N within a Category")

- **Purpose:** Show the top 'N' items *for each category/group* (e.g., top 5 products in each region).
- **Steps:**
  1. Place your Category (e.g., `Region`) on `Rows` / `Columns`.
  2. Place your Sub-Category (e.g., `Product Name`) on `Rows` / `Columns` (to the right/below the Category).
  3. Place your Measure (e.g., `Sales`) on the opposite `Rows` / `Columns` shelf.
  4. **Sort** the Sub-Category by the Measure (Descending). (Click the sort icon on the axis or the Sub-Category pill on the shelf, then choose sorting options).

5. **Create Calculated Field** (`Analysis > Create Calculated Field`):
    - **Name:** `Ranking`
    - **Formula:** `INDEX()`
    - **Important:** Click `Default Table Calculation` (bottom right of formula editor).
    - **Compute Using:** Select your `Sub-Category` (e.g., `Product Name`). This tells `INDEX()` to rank items *within each category*.
    - `OK` .
6. Drag the `Ranking` calculated field to the `Rows` / `Columns` shelf (between Category and Sub-Category if you want to see the rank).
7. Right-click `Ranking` on the shelf > `Convert to Continuous` .
8. Drag `Ranking` to the `Filters` shelf.
9. In the Filter dialog > `Range of Values` > Set `Min: 1` , `Max: N` (e.g., 5 for Top 5). `OK` .
10. *Optional:* To hide the rank numbers on the chart: Right-click `Ranking` on the shelf > `Hide Field Labels for Rows` / `Columns` .

3. Binning Measures

- **Purpose:** Group numeric data into discrete ranges (bins) for histograms or custom groupings.
- **Basic Binning:**
    1. Right-click your Measure (e.g., `Sales`) in the `Data Pane` .
    2. `Create > Bins...`
    3. Specify `Size of bins` (e.g., `500` for $500 ranges). `OK` .
    4. Drag the newly created `[Measure (bin)]` (e.g., `Sales (bin)`) to `Rows` .
    5. Drag the original Measure (e.g., `Sales`) to `Columns` . Right-click it on `Columns` > `Measure (Sum) > Count` (for a histogram).
- **Custom Binning (using Calculated Field):**
    1. Right-click Measure (e.g., `Sales`) > `Create Calculated Field` .
    2. **Name:** `Adjusted Sales` (or similar).

3. **Formula:** `IF [Sales] >= 8500 THEN 8500 ELSE [Sales] END` (This groups all sales >= 8500 into the 8500 bin).
4. `OK`.
5. Now create bins from this `Adjusted Sales` field as above.

4. Running Total / Percent of Total (Pareto Analysis)

- **Purpose:** Show cumulative totals and their percentage contribution, often for Pareto charts.
- **Steps:**
  1. Place Dimension (e.g., `Category`) on `Columns` and Measure (e.g., `Sales`) on `Rows`.
  2. **Sort** the Dimension by the Measure (Descending).
  3. **Running Total:** Right-click the Measure pill on `Rows` > `Add Table Calculation...`
     - `Calculation Type:` `Running Total`
     - `Compute Using:` `Specific Dimensions` > Check your Dimension (e.g., `Category`).
  4. **Percent of Total:** Check `Add secondary calculation`.
     - `Secondary Calculation Type:` `Percent of Total`
     - `Compute Using:` `Specific Dimensions` > Check your Dimension (e.g., `Category`).
     - `Close`.
  5. **Dual Axis (for combined chart):** Drag the original Measure (e.g., `Sales`) to the right of the existing Measure on `Rows`.
  6. Right-click the **rightmost** Measure pill on `Rows` > `Dual Axis`.
  7. Right-click the **right axis** > `Synchronize Axis`.
  8. On the `Marks Card`, select `All`. Drag `Measure Names` to `Size` (to vary bar width based on sales). *Then, crucially, remove* `Measure Names` *from* `Color` *on the* `All` *Marks card to prevent unintended coloring.*

5. Reference Lines

- **Purpose:** Add lines/bands for averages, targets, standard deviations, etc.

- **Steps:**
    1. Right-click the **axis** (`Y-axis` for vertical, `X-axis` for horizontal).
    2. `Add Reference Line, Band, or Box...`
    3. **Line Type:** `Line`, `Band`, or `Distribution`.
    4. **Value:** `Average`, `Constant`, `Parameter` (if linking to a parameter).
    5. **Scope:** `Entire Table`, `Per Pane` (for each column/row group), `Per Cell` (for each individual cell).
    6. **Distribution (for Control Charts):**
        - `Value:` `Standard Deviation`
        - `Factors:` `3,3` (for 3 standard deviations above/below average).
        - `Fill:` Choose a fill color (e.g., `Light Gray`).

6. Dual Axis

- **Purpose:** Overlay two measures with different scales on the same chart.
- **Steps:**
    1. Drag your first Measure to `Rows` / `Columns`.
    2. Drag your second Measure to the *opposite side* of the `Rows` / `Columns` shelf (e.g., if first is on left `Rows`, drag second to right `Rows`).
    3. Right-click the **second** Measure pill on the shelf > `Dual Axis`.
    4. Right-click the **right-hand axis** (the one that appeared with the second measure) > `Synchronize Axis`.
    5. Adjust `Marks Card` types (e.g., one `Bar`, one `Line`) as needed.

7. Parameters

- **Purpose:** Allow users to interactively change values, fields, or chart types.
- **Create Parameter:**
    1. In the `Data Pane` (below Measures), right-click empty space > `Create Parameter...`
    2. **Name:** (e.g., `Choose Measure`, `Viz Type`, `Target Value`)

3. **Data Type:** `String` (for text options), `Float` / `Integer` (for numeric inputs).
4. **Allowable Values:**
    - `All`: Free entry.
    - `List`: Manually enter options (e.g., `Value: 'Sales'`, `Display As: 'Sales Revenue'`).
    - `Range`: Set Min/Max/Step Size.
5. `OK`.
6. **Show Parameter Control:** Right-click the newly created parameter in the `Parameters Pane` > `Show Parameter Control`.

- **Link Parameter to Calculated Field:**
    - **Dynamic Measure:**
        1. `Analysis > Create Calculated Field`
        2. **Name:** `Dynamic Measure Calc`
        3. **Formula:** `CASE [Parameter Name] WHEN 'Sales' THEN SUM([Sales]) WHEN 'Profit' THEN SUM([Profit]) END`
        4. Drag `Dynamic Measure Calc` to `Rows` / `Columns`.
    - **Dynamic Chart Type:**
        1. `Create Parameter` (e.g., `Viz Type`, `String`, `List: Bar, Line`).
        2. `Create Calculated Field` (e.g., `Sales Bar`): `IIF([Viz Type]='Bar',[Sales],null)`
        3. `Create Calculated Field` (e.g., `Sales Line`): `IIF([Viz Type]='Line',[Sales],null)`
        4. Drag `Order Date` to `Columns`. Drag `Sales Bar` to `Rows`.
        5. Drag `Sales Line` to `Rows` (right of `Sales Bar`). Set `Dual Axis` & `Synchronize Axis`.
        6. On `Marks Card`, select `SUM(Sales Bar)` > `Mark Type: Bar`. Select `SUM(Sales Line)` > `Mark Type: Line`.
        7. *Crucial:* On `Marks Card`, select `All` > Remove `Measure Names` from `Color`.