

Summary – Day 4&5

- Calculated fields allow to create new data from data that already exists in the data source.
- When one creates a calculated field, essentially one is creating a new field (or column) in the data source, the values, or members of which are determined by a calculation that one controls.
- This new calculated field is saved to the data source in Tableau, and can be used to create more robust visualizations.
- The calculations are normally created in the calculated field box where one needs to type in the logical formula in order to arrive at the specific requirement.
- There are 3 types of calculations available.
 - **Basic Calculations**
 - **Level of Detail Expressions (LOD's)**
 - **Table Calculations**
- Basic expressions allow one to transform values or members at the data source level of detail (a row-level calculation) or at the visualization level of detail (an aggregate calculation).
- Basic calculations are expected to be done in Calculated Field box.
- Calculated Field can be created by Analysis → Create Calculated Field
- **Types of functions:**
 - **Aggregate Functions:**
 - SUM: Used for addition
 - AVG: To find out the average value
 - MIN: To find the minimum value
 - MAX: To find the maximum value
 - COUNT: To count the non-empty values
 - COUNTD: To count the distinct/unique values

- **Logical Functions:**

- IF: To write the conditional statement
- ELSEIF: To write nested conditional statements
- AND: To write multiple conditional statements
- OR: To write multiple conditional statements
- CASE: Same as IF
- ISNULL: To check whether a column consists of null record or not

- **Table Calculation Functions:**

- RANK: To find the rank of any expression in descending mode by default
- INDEX: To generate serial numbers
- LOOKUP: To refer the value present in the chart. 0→Current, -1→Previous, 1→Next
- WINDOW_SUM: To carryout the sum in specific window e.g. -2 to 0
- RUNNING_SUM: To find the cumulative sum
- TOTAL: To find the grand total

- **String Functions:**

- CONATINS: Returns true if the given string contains the specified substring
- FIND: Returns the index position of substring in string, or 0 if the substring isn't found
- TRIM: Returns the string with leading and trailing spaces removed
- LEFT: To get the characters from left
- RIGHT: To get the characters form right
- REPLACE: Searches string for substring and replaces it with replacement. If substring is not found, the string is not changed

- **Date Functions:**

- DATE: Returns a date given a number, string, or date expression.
- DATEADD: Returns the specified date with the specified number interval added to the specified date_part of that date.
- DATEDIFF: Returns the number of date parts (weeks, years, etc) between two dates.
- NOW: Shows current date and current time
- TODAY: Shows current date
- YEAR: To extract year value from the date/datetime
- MONTH: To extract month value from the date/datetime
- QUARTER: To extract quarter value from the date/datetime
- DATEPARSE: Returns specifically formatted strings as dates
- DATETRUNC: This function can be thought of as date rounding. It takes a specific date and returns a version of that date at the desired specificity
- DATEPART: Returns the name of the specified date part as an integer
- DATENAME: Returns the name of the specified date part as a discrete string.

- **Number Functions:**

- ZN: $ZN(100) = 100$ | $ZN(Null) = 0$
- ROUND: Rounds off a number to a specific decimal point.

- ABS: To find the absolute value e.g. $ABS(-7) = 7$

- **LOD's:**

- Just like basic calculations, LOD calculations allow one to compute values at the data source level and the visualization level.
- However, LOD calculations give even more control on the level of granularity one wants to compute.
- They can be performed at a more granular level (INCLUDE), a less granular level (EXCLUDE), or an entirely independent level (FIXED) with respect to the granularity of the visualization.

- **LOD's Types:**

- Fixed
- Include
- Exclude

- **Fixed LOD:**

- The FIXED type of LOD expression involves calculations that only considers the dimensions specified by the user.
- It does not consider the dimension present in the view.
- For example, $\{FIXED [Customer Name]: MAX([Order Date])\}$

- **Include LOD:**

- The INCLUDE expression will include an additional dimension along with the one specified by the user along with the dimensions present in the view.
- It shows the highest level granularity than rest of the LOD's
- For example, $AVG(\{INCLUDE [Region]: SUM(Sales)\})$

- **Exclude LOD:**

- The EXCLUDE level of detail or LOD in Tableau is used when one wishes to omit a dimension from the view level of detail.
- For example, $\{Exclude [Segment]: SUM(Sales)\}$

- Table calculations are a special type of calculated field within Tableau Desktop that apply transformations (i.e. additional math) on values within a visualization.

- Common examples of table calculations include running sum, moving average, and percent of total etc.

- Calculations are computed over local data (post-filtered data) within Tableau.

- **Calculation Types:**

- **Difference From:**
 - To find the difference between two values across/down $(X-Y)$
- **Percent Difference From:**
 - To find percentage difference between two values across/down $(X-Y)/Y$

- **Percent From:**
 - To find percentage of one value w.r.t. another value across/down (X/Y)
- **Percent of Total:**
 - To find the percentage of one value w.r.t. grand total or subtotal for that column across/down ($a/a+b+c+d$)
- **Rank:**
 - To give the ranking to numerical fields. Rank =1 if the field is the highest.
- **Percentile:**
 - To give percentile to numerical fields. Percentile=100% for the highest value
- **Running Total:**
 - To compute the cumulative sum/average
- **Moving Calculation:**
 - To calculate moving/rolling/window sum or average of numerical column
- **Compute Using:**
 - There are mainly two directions with which one can perform the calculations.
 - Across: Calculations are done horizontally
 - Down: Calculations are done vertically
- **Relative To:**
 - Relative To explains the fact as to with respect to what value one needs to compute the calculation. Below are its types.
 - Previous: Refer previous value across/down
 - Next: Refer next value across/down
 - First: Refer first column/row in across/down mode resp.
 - Last: Refer last column/row in across/down mode
 - One gets to see more options in Relative To section in case one chooses Specific Dimensions in Compute Using section.
- One can also perform the table calculations by right-click on SUM(Sales) & selecting Quick Table Calculation and do all the above mentioned calculation types easily.