Tableau Concepts

Tableau Basics

Type of BI tools

- Spreadsheets
- Reporting software
- Data visualization software
- Data mining tools
- Online analytical processing (OLAP

Investopedia:
Business intelligence (BI) refers to the procedural and technical infrastructure that collects, stores, and analyzes the data produced by a company's activities.

BI is a broad term that encompasses data mining, process analysis, performance benchmarking, and descriptive analytics. BI parses all the data generated by a business and presents easy-to-digest reports, performance measures, and trends that inform management decisions.

Important links

Tableau Public download - https://public.tableau.com/en-us/s/download

BI tools capabilities -
https://www.selecthub.com/business-intelligence/list-bi-capabilities/
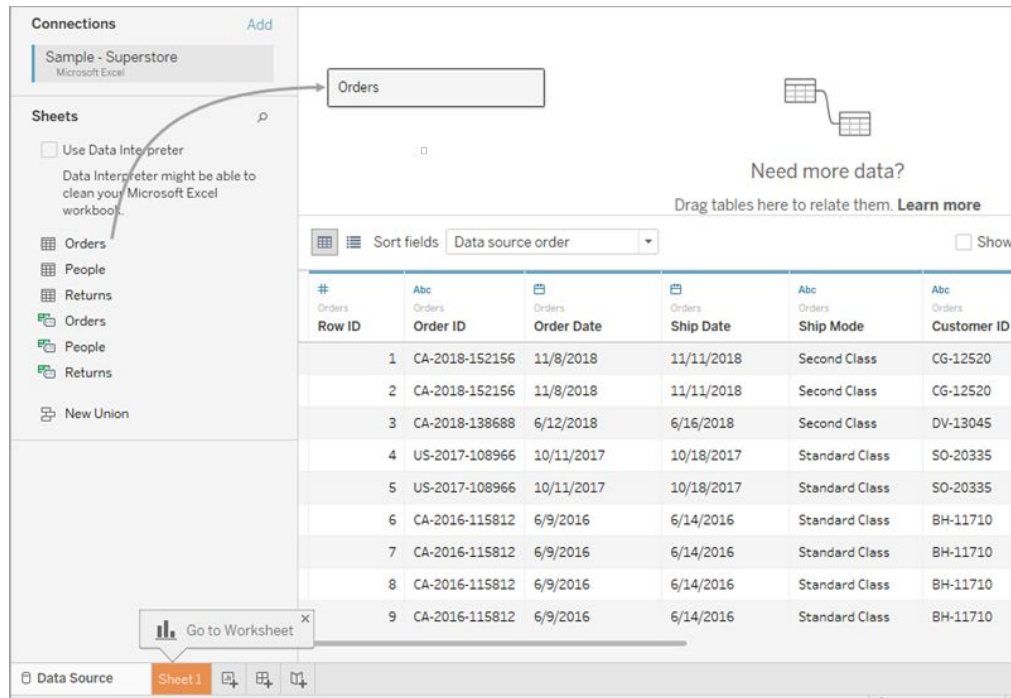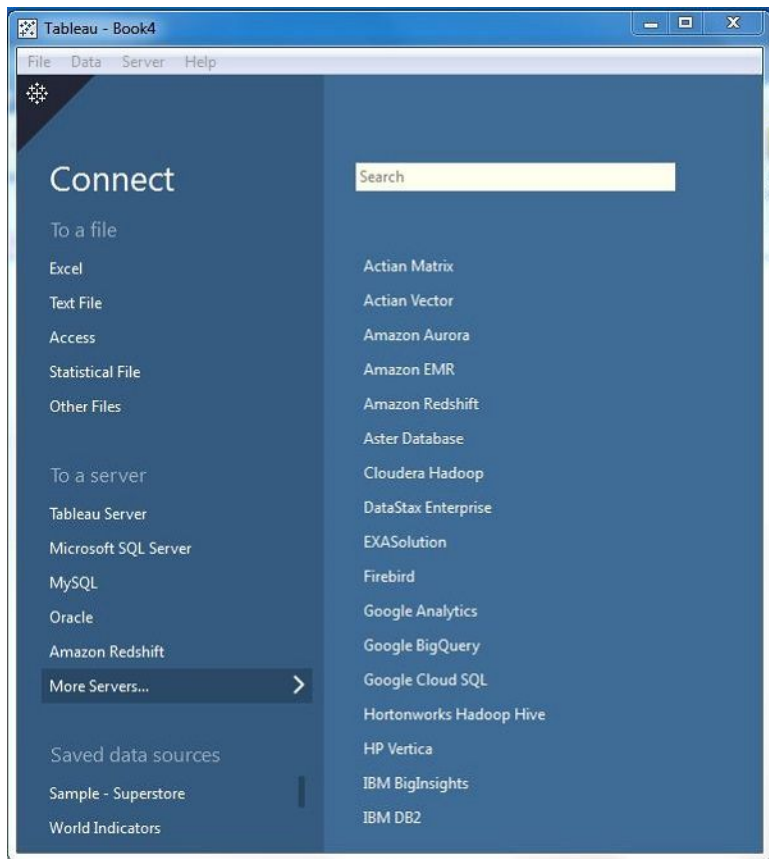
Getting started -
https://help.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-home.htm

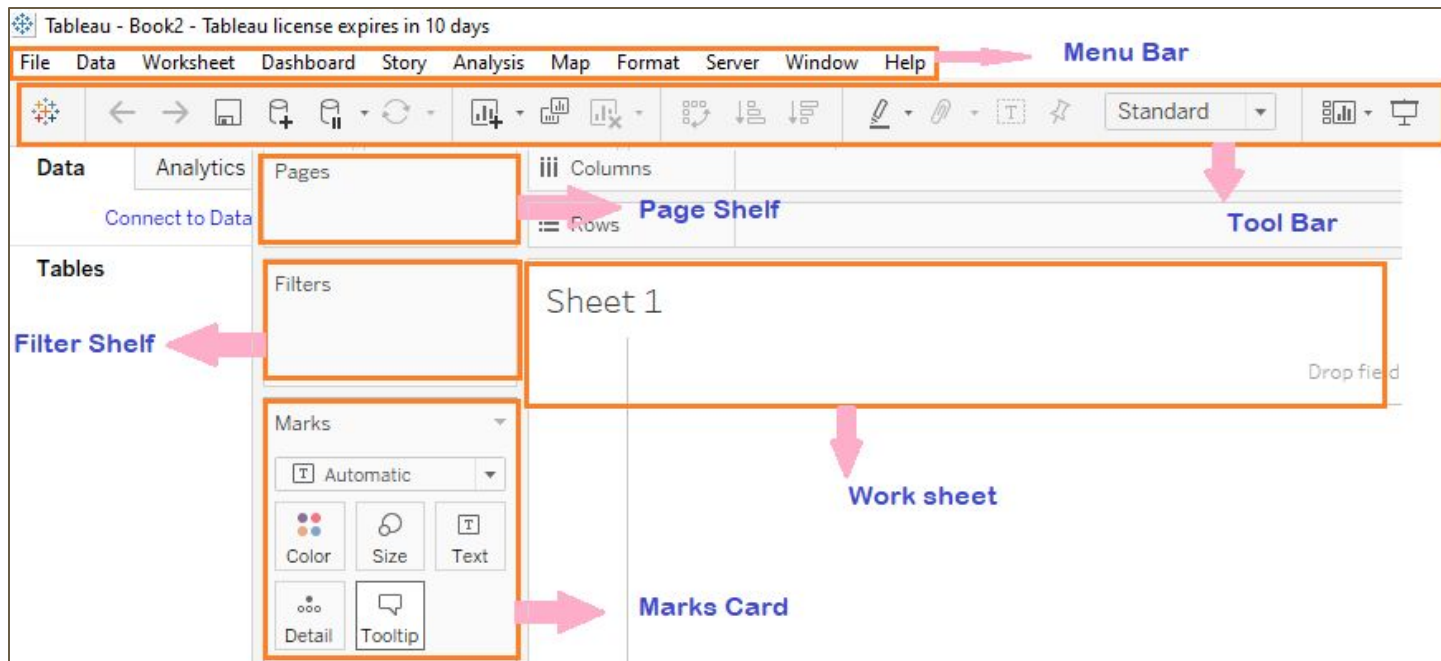**Tutorial** - https://www.tutorialspoint.com/tableau/index.htm

Learning videos and datasets - https://public.tableau.com/en-us/s/resources

Connecting to data

Tableau workspace

- Menu
- Toolbar
- Data pane
- Analytics bar
- Shelves
  - Pages
  - Columns
  - Rows
  - Filters
- Marks
  - Color
  - Size
  - Text
  - Detail
  - Tooltip
- Canvas
- Show me

Workbook ; Sheet ; Dashboard ; Story - Navigate through them by using controls at bottom right

Some important concepts

- Measures are values that are aggregated - 5 aggregate functions. **Ex: Sales**
- Dimensions are values that determine the level of detail at which the measures are aggregated - like creating groups. **Ex: Region**
- Discrete (blue) fields - They render as headers or different colors
- Continuous (green) fields - Numeric and Date fields in general. They render as axes or color gradients
- While most dimensions are discrete by default, and most measures are continuous by default, any measure can be used as discrete and some dimensions as continuous fields in views (right click in Data pane and select convert. Or in view)

		can be	
		Discrete	Continuous
A	Dimension	Yes	If **Numeric** or **Date**
	Measure	Yes	Yes

Basic Visualizations

Bar charts : To compare values across different categories

Understand "View level of detail". When multiple dimensions are there like Region and Department, all combinations are shown up using marks

Line charts typically indicate change in values across time

Dashboard is a collection of views, filters, parameters etc. that communicate a data story

Working with Data

- **VizQL** allows Tableau to translate our actions, as we drag and drop fields of data, into a query language that shows data in the required format.
- Tableau will automatically convert VizQL into a native query to be run by source data engine

- Where aggregations are required in the view the data source will return only aggregated values and not all rows. We can select all elements in a view, right click and **view data.** We can also view **full data** at which point the data source will be queried.
- The results are stored in cache and the cache is used when different visualizations are required. Until unless data source querying is required

Working with Data

- File based data sources
- Connecting to data on a server
- Data extracts
- Connecting to data on Cloud

https://help.tableau.com/current/pro/desktop/en-us/exampleconnections_overview.htm

https://data-flair.training/blogs/tableau-data-extract/

Filtering Data

- Data source filters
- Extract filters
- Custom SQL filters using parameters
- Using the Filters shelf
- Right click any field in Data pane - Show filter

Filtering discrete fields

- General
- Wildcard
- Conditions based on aggregations
- Top

Filtering Data

Filtering continuous fields

- Categories
  - All values
  - Aggregation
- Actual filters
  - Range
  - At least
  - At most
  - Special (for NULL values)

Filtering dates

More Visualizations

- **Comparison**
  - Bar charts
  - Bullet charts - to show progress towards a goal
  - Bar-in-bar charts - - to show progress towards a goal or compare 2 values within a category
- **Dates and Times**
  - Line charts - You can experiment with different options for Date fields
  - Gantt charts - To view dependencies between events, overlap etc.
- **Relating parts of the data to the whole**
  - Stacked bars
  - Tree maps
  - Area charts
  - Pie charts

More Visualizations

- **Distributions**
  - Circle charts
  - Box and Whisker plots
  - Histograms
- **Multiple axes**
  - Scatter plot
  - Dual axis and combination charts
- **Geographical charts**
  - Filled maps
  - Symbol maps

Working with Date fields

Right click on a Date field shows 3 major parts:

- **Date part** - It represents specific part of a date like quarter, month etc. It is used by itself without reference to any other part of the date. For example April shows all data for April in the dataset
- **Date value** - Here April will be shown for every year etc.
- **Exact value** - Each value is considered separately

- Date parts are discrete by default. Other 2 are continuous by default. But they can be changed as required
- Using a continuous date value instead of multiple discrete date parts will help in connecting lined across multiple years, quarters and months

Groups, Hierarchies and Sets

Tableau Groups are a collection of multiple members in a single dimension that is combined to form a higher category. Tableau allows single-dimensional members to be grouped together and automatically creates a new dimension with the Tableau Group at the end of the name.

The level-wise configuration is represented by **Hierarchy**, which is a tree-like structure. Data with relationships can be used to create a Hierarchy in Tableau.

Tableau Sets are custom fields that are used to keep a subset of data based on a condition. You can create a Tableau Set in real-time by selecting members from a list or a visualization. You can do the same thing by writing custom Conditions or selecting a few records from the top or bottom of a Measure.

Calculations

- A calculated field will show up either as a new measure or dimension in the data pane. They can be used to extend data and provide additional flexibility and interactivity.-
- The code in the calculated field returns a value either at row level or aggregate level
- Required code can be typed in the Code editor. Fields can be dragged from view or the data pane
- **Calculations consist of code that's made up of functions, operations, and reference to other fields, parameters, constants, groups or sets**
- The result can be per row of data or at an aggregate level

Calculations

- The Functions list contains all the functions that can be used in the code. They are grouped according to their overall use
- Number; String; Date; Type conversion; Logical; Aggregate; User (To customize user experience); Table calculation (To work on aggregated data); Spatial

- Quick table calculations are predefined table calculations that can be applied to fields used as measures in the view
- Running total, Moving average, YTD total etc.

Parameters

- A Parameter in Tableau is a placeholder for a single, global value such as a number, date or string
- They can be shown as controls like sliders, dropdowns etc. to end users so that they can be changed
- The value of a parameter is global across workbook

- Creating a parameter is similar to creating a calculated field.
- The allowable values option can have All, List or Range
- The dropdown for the parameter contains Show Parameter Control, to add it to view
- Its appearance and behavior can also be customized using caret in the upper right

Dashboards

- A Dashboard is an arrangement of individual visualizations along with legends, filters, parameters, text, containers etc.
- They should work together to tell a complete story in an interactive way
- Approaches to building Dashboards:
  - Guided analysis
  - Exploratory
  - Score card / Status snapshot
  - Narrative

Dashboards are made up of objects on a canvas which can be tiled or floating

Dashboards

Each object will have : Grip; Remove from Dashboard; Go to sheet; Use as filter; More options; Object sizing border

Tableau support six kinds of actions for interactivity:

- Filter actions
- Highlight actions
- URL actions
- Go to sheet
- Parameter actions
- Set actions

Relationships, Joins and Blends

- Data Blending allows a combination of data from different data sources to be linked. Whereas, Data Joining works only with data from one and the same source. For example: If the data is from an Excel sheet and a SQL database, then Data Blending is the only option to combine the two types of data.

- Data blending simulates a traditional left join. The main difference between the two is when the aggregation is performed. A join combines the data and then aggregates. A blend aggregates and then combines the data

- Blends, unlike joins, never truly combine the data. Instead, blends query each data source independently, the results are aggregated to the appropriate level, then the results are presented visually together in the view.

Thank You