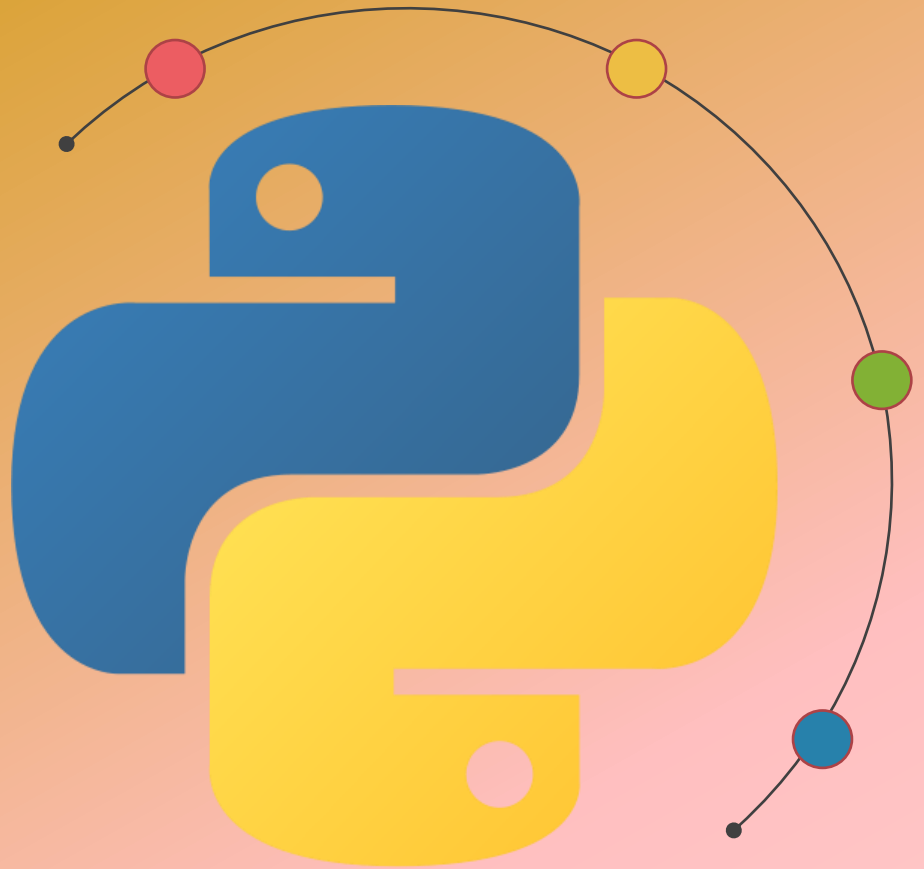
Python Curriculum



1

An introduction to python:

- Brief History
- Why Python
- Where to use

2

Beginning python basics:

- The print statement
- Comments
- Python Data Structures & Data Types
- String Operations in Python
- Simple Input & Output
- Simple Output Formatting

3

Python program flow:

- Indentation
- The If statement and its' related statement
- An example with if and it's related statement
- The while loop
- The for loop
- The range statement
- Break & Continue
- Assert
- Examples for looping

4

Functions & modules:

- Create your own functions
- Functions Parameters
- Variable Arguments
- Scope of a Function
- Function Documentation/Doc strings
- Lambda Functions & map
- An Exercise with functions
- Create a Module
- Standard Modules

5

Exceptions

- Errors
- Exception handling with try
- Handling Multiple Exceptions
- Writing your own Exceptions

6

File handling:

- File Handling Modes
- Reading Files
- Writing & Appending to Files
- Handling File Exceptions
- The with statement

7

class

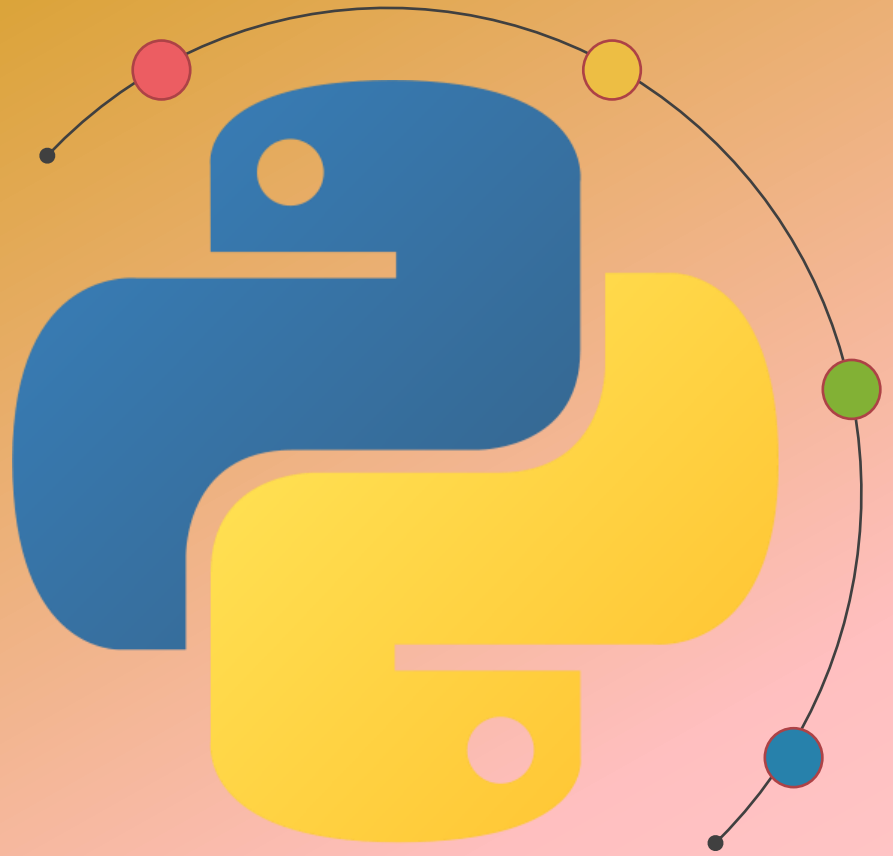
- New Style Classes
- Variable Type
- Static Variable in class
- Creating Classes
- Instance Methods
- Inheritance
- Polymorphism
- Encapsulation
- Scope and Visibility of Variables
- Exception Classes & Custom Exceptions

8

Regular expressions:

- Simple Character Matches
- Special Characters
- Character Classes
- Quantifiers
- The Dot Character
- Greedy Matches
- Grouping
- Matching at Beginning or End
- Match Objects
- Substituting
- Splitting a String
- Compiling Regular Expressions
- Flags

Python Curriculum



9

Data structures:

- `List Comprehensions
- Nested List Comprehensions
- Dictionary Comprehensions
- Functions
- Default Parameters
- Variable Arguments
- Specialized Sorts
- Integrators
- Generators
- The Functions any and all
- The with Statement
- Data Compression
- Closer
- Decorator

10

Database and Operations:

- Install postgres server on windows
- Install postgres server on linux
- Install postgres-Python connector
- Creating database
- Creating tables
- Insert data into database
- Inserting images
- Retrieving Data
- Update data
- Delete Data
- Practice, Questions and exercise

11

Oops

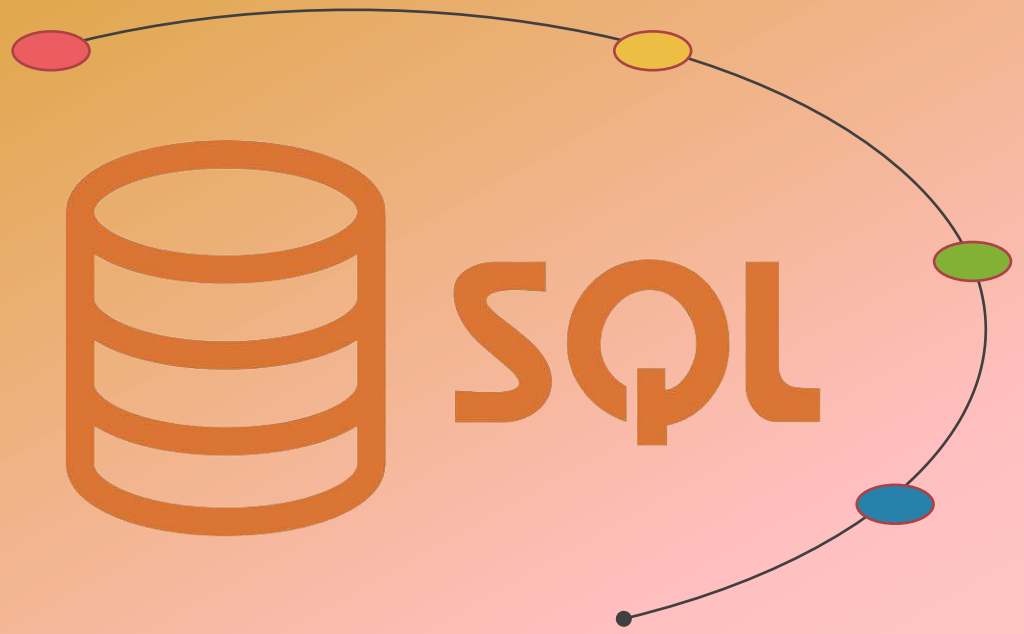
- What are classes and objects
- Defining classes & attributes
- Constructor
- Instance Methods
- Inheritance
- Abstraction and Encapsulation
- Polymorphism
- Method hiding
- Private, Public and protected

12

Advance Library's of Python

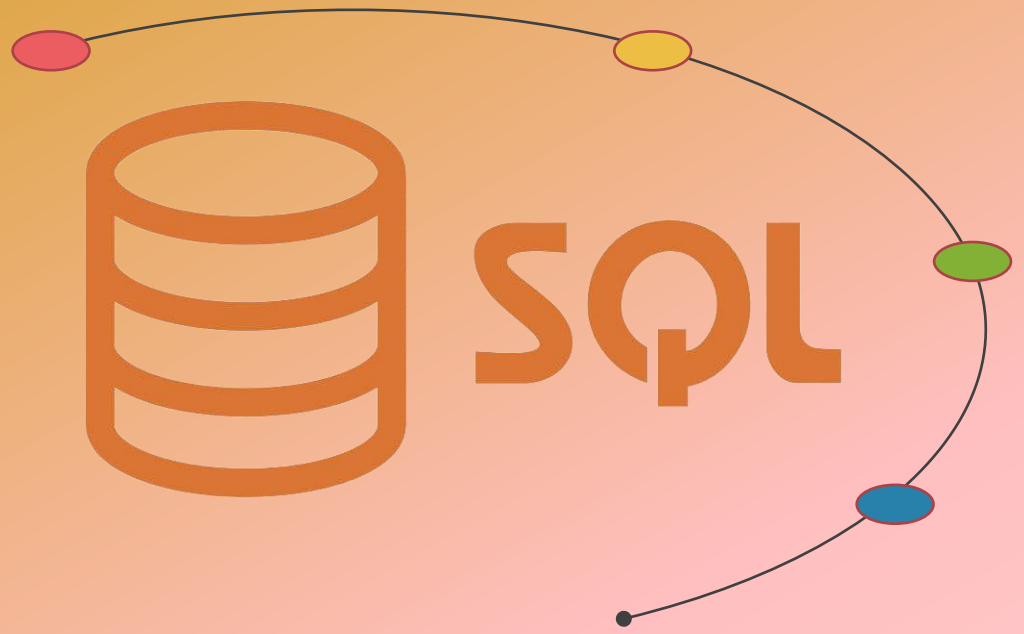
- Introduction to NumPy and Pandas
- Creating NumPy arrays from Python structure
- indexing and Slicing arrays
- rearrange and linspace methods
- what is Pandas used for
- pandas series
- what is data frames ?
- Creating data frames
- Reading csv, excel and txt files
- Practice, Questions and exercise

SQL Curriculum



1. **An introduction to sql:**
2. **Processing Capabilities of SQL**
3. **Data Definition language**
4. **Various SQL commands and functions**
   - Expanded
   - Union operators
   - Drop table
   - Table aligns
   - Updating multiple columns
   - Using expression in update
   - Updating Null Values
   - Delete command
   - Insert command
   - Moving Command
   - Group- by command
5. **Symbols used in syntax of statements:**
6. **Constraint**
   - Primary
   - Default
   - Check
7. **Applying table constraints**
8. **Relational operators**
9. **Logical operators**
10. **Condition based on range**
11. **Condition based on list**

SQL Curriculum



12 **Condition based on list**

13 **Built UI function**

14 **Joins**

15 **Real-time Projects**

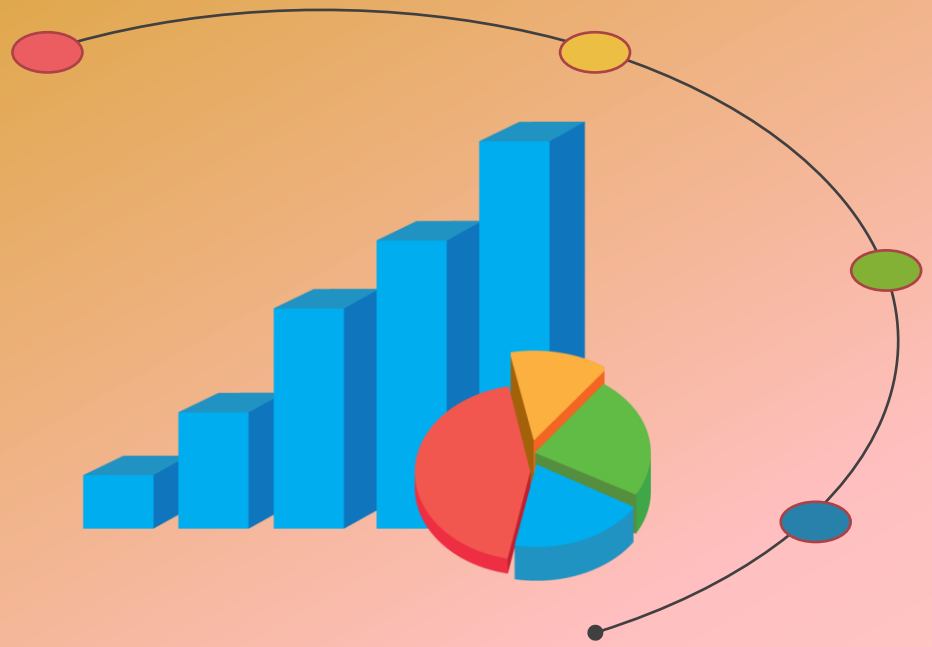
Keys

- **Primary**
- **Foreign**
- **Candidate**

17 **Privileges**

18 **Triggers**

Statistics



1

Statistical inquiry

- Making sense of experience
- What is statistic?
- Descriptive & inferential statistics
- Collecting a Sample

2

Describing Our Sample

- Statistical Variables
- Error, accuracy and approximations

3

Summarizing our Data

- Tables and diagram
- Central tendency (averages)
- Measures of dispersion

4

The shape of a distribution

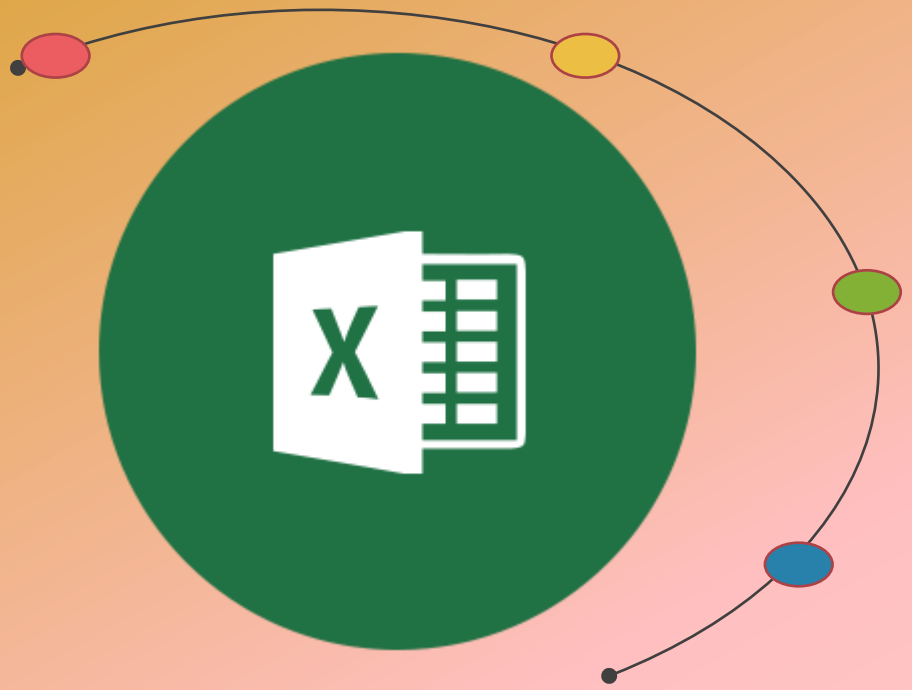
- Skewed distribution
- Introducing the normal distribution
- Proportions under the normal curve
- Comparing values

5

From sample to population

- Estimates and inferences
- The logic of sampling

Advance Excel



1

Introduction to MS Excel

- **What is Excel**
- **Why it is used**

2

Understand the Ribbon & Functionality

3

Explain Basic Formulas

1. **Arithmetic operation**
   - **Addition**
   - **Multiplication**
   - **Subtraction**
2. **Sum**
   - **Average**
   - **Min**
   - **Max**
3. **Sigma Average**
4. **Data Average**
5. **Data Validation**

4

Security

- **File Level Security**
- **Worksheet Level Security**
- **Unprotecting a Worksheet**
- **Workbook level**

5

Worksheet

- Rows
- Columns

6

How to center Data

- Selection
- Deleting the Data
- Moving Data

7

Excel Conditions

- If Function
- If with calculations
- Excel count if
- Advanced if statement

Advance Excel

8 **Automating day to day task through macros & VBA**

9 **Maintain large sets of excel data in a list or table**

10 **Create reports by use of popular tools, pivot tables.**

- Vlook up
- Index
- Match function

11 **Gross referencing in Excel**

12 **MS Excel themes**

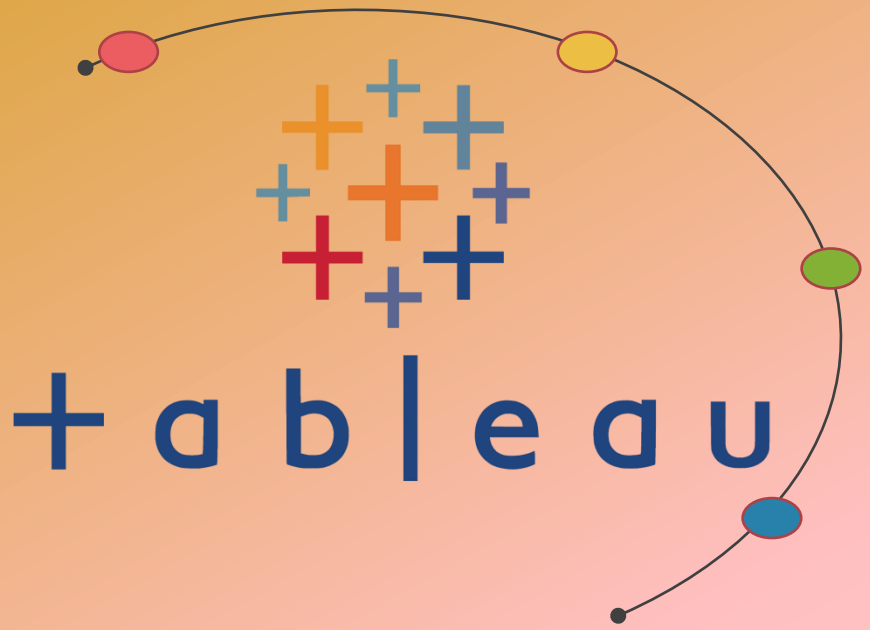
- Creating theme
- Modification in theme
- How to change effects

13 **Templates**

- Graphics
- How to create a template

14 **Data Analysis using Excel**

TABLEAU



1

Introduction Tableau Desktop

- Installing Tableau
- Community Tool,
- Interface & workflow
- Help resources, etc.

2

Connecting to Data

- Connecting types
- Data interpreter
- Unions & joins
- Live connections vs. extracts, etc.

3

Sorting, Filtering & Grouping

- Dimensions vs. measures
- Context filters
- Sets & hierarchies
- Action filters, etc.

4

Visualizing Data with the marks card

- Marks types
- Visual properties
- Stacking marks
- The pages shelf
- Analytics tools, etc.

5

Analysing Data with Calculations & Parameter's

- Aggregations
- Table Calculations
- LOD Expressions
- Parameters
- Addressing & partitioning, etc.

6

Building Interactive Dashboards

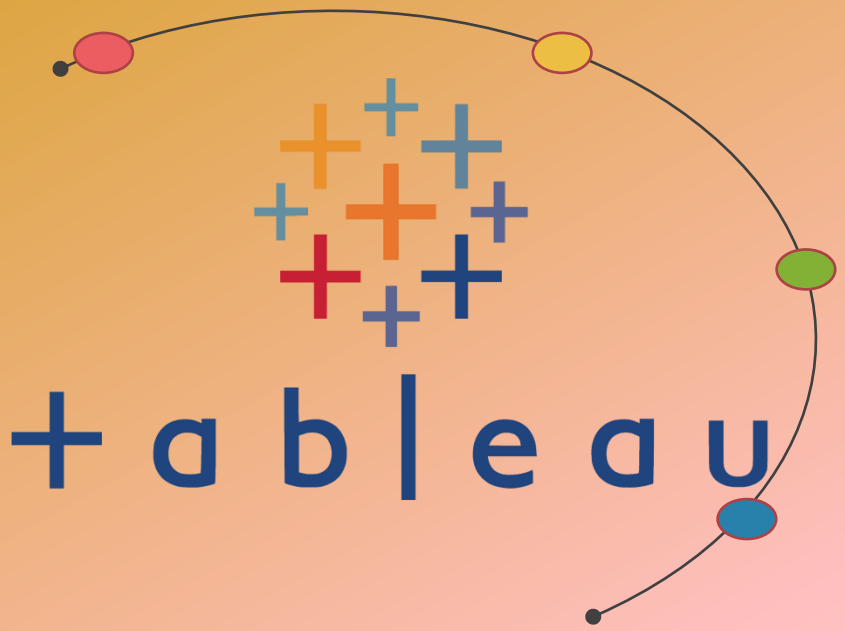
- Dashboard objects & sizing
- Tiled vs. floating
- Device designer, stories, etc

7

Creating Basic Visulaisations

- Bar chart
- Geographic map
- Crosstabs report
- Scatter plot
- Line chart

TABLEAU



8

Connecting to Data

- Live connection
- Extract data
- Combine data sources
- Join tables
- Blend data sources
- Cross- database join

9

Mapping

- Geographic maps
- Filled maps
- Mapping options

10

Multiple visulisation

- Measure names and measure values
- Side by side bar
- Combined axis cart
- Stacked marks
- Dual axis chart
- Bar in bar chart

11

Reference Lines, Bands & Distributions

- Reference line
- Options available
- Reference band
- Reference distribution
- Boxplot
- Instant analytics

12

Advanced Mapping

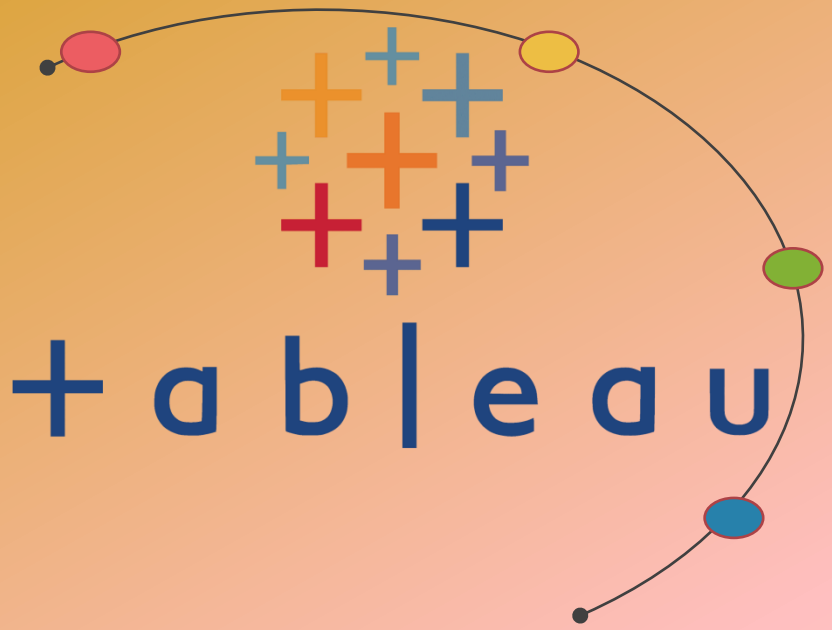
- Point to point maps
- Calculation distance between two points on a map

13

Creating Sets

- Statistic sets
- Dynamic sets
- Combined sets

TABLEAU



14

Trends and forecasting

- Create trend lines
- Model types
- Create forecast

15

Formatting Visualisation

16

Data Connection & Data Sources

- Files
- Relational databases
- OLAP databases
- Big data sources
- Cloud data sources
- Tableau data server

17

Advanced Calculations

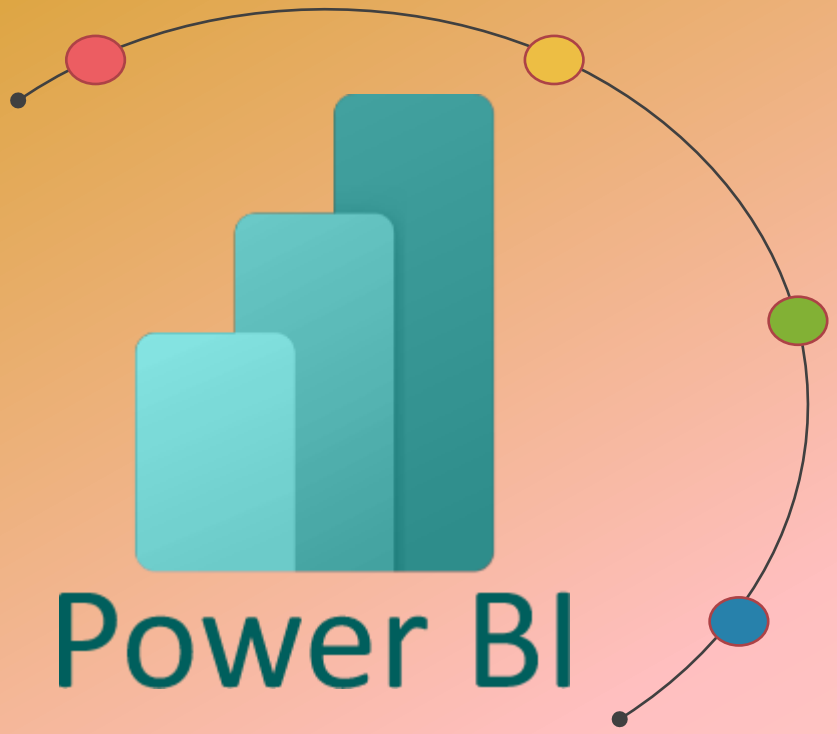
- Split/custom split
- Profitability as a percent of total
- Level of detail (Fixed, include, exclude)
- Size (number of row in partition)

18

Bump chart

- Hockey stick chart
- Pareto chart
- Gantt bar chart
- Waterfall chart
- Sparklines
- Market basket analysis\
- Multiple bars & lines
- Box plot
- Band chart
- Benfords la

Power BI



1

Introduction to Power BI

- Power BI Job Roles in Real-time
- Power BI Data Analyst Job Roles
- Business Analyst-Job Roles
- Power BI Developer – Job Roles
- Power BI for Data Scientists
- Comparing MSBI and Power BI
- Comparing Tableau and Power BI
- Types of Reports in Real-World
- Interactive & Paginated Reports
- Analytical & Mobile Reports
- Data Sources Types in Power BI
- Power BI Licensing Plans- Types
- Power BI Training: Lab Plan
- Power BI Dev & Prod Environments
- Understanding the Power BI Tools
- Installing Power BI & Connecting to Data
- The “Locale” used in the curriculum
- Working with the query Editor
- Working with the data model and creating a visualization

2

Basic Report Design

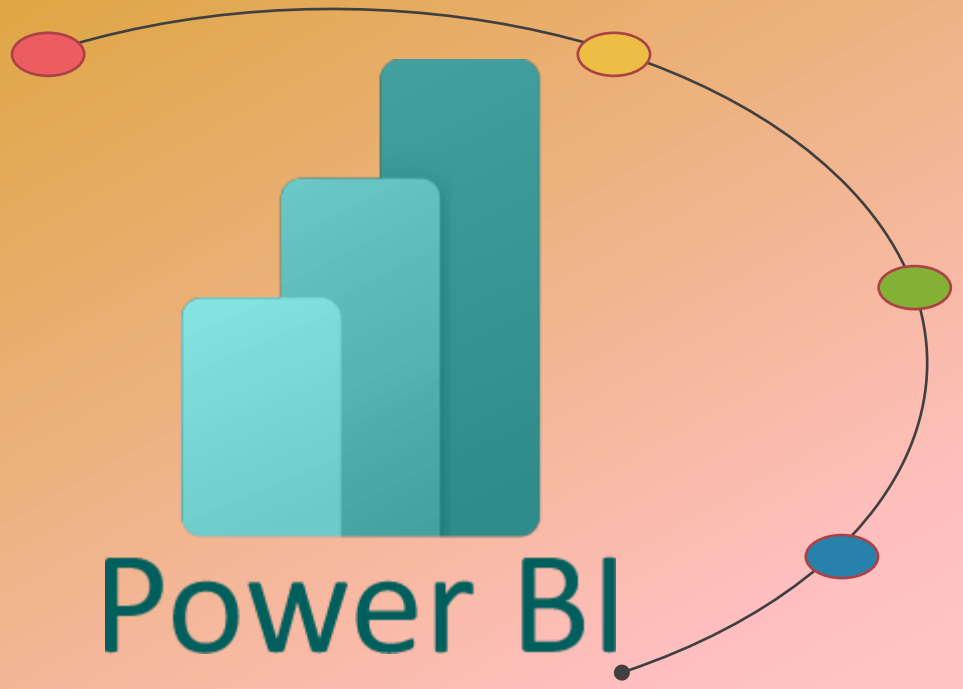
- Power BI Desktop Installation
- Data Sources & Visual Types
- Canva, Visualizations and filed
- Get Data and Memory Tables
- In- Memory xvelocity Database
- Table and Tree Map Visuals
- Format Button and Data Labels
- Legend, Category and Grid
- PBIX and PBIT File Formats
- Visual Interaction, Data points
- Disabling Visual Interactions Edit Interactions-Format Options
- SPOTLIGHT & FOCUSMODE
- CSV and PDF Exports. Tooltips
- Power BI Ecosystem, Architecture

3

Visual Sync and Grouping

- Slicer visual: Real-time usage
- Orientation, Selection Properties
- Single & Multi select, CTRL options
- Slicer: Number, Text and Date Data
- Slicer list and slicer dropdowns
- Visual Sync Limitations with Slicer
- Disabling Slicers, Clear Selections
- Grouping: Real-Time Use, Examples
- List Grouping and Binning Options
- Grouping Static/Fixed Data Values
- Grouping Dynamic/Changing Data
- Bin Size and Bin Limits(Max, Min)
- Bin Count and Grouping Options
- Grouping Binned Data, Classification

Power BI



4

Bookmarks, Azure Modeling

- Drill-thru Filters, Page Navigations
- Bookmarks: Real-Time Usage
- Bookmarks for Visual Filters
- Bookmarks for page Navigations
- Selection Pane with Bookmarks
- Button, Images with Actions
- Buttons, Actions amd Text URLs
- Bookmarks View & Selection Pane
- OLTP Databases, Big Data Sources
- Azure Database Access, Reports
- Import & Direct Query with Power BI
- SQL Queries and Enter Data
- Data Modeling: Currency, Relations
- Summary, Format, Synonyms
- Web View & Mobile View in PBI

5

Visualization Properties

- Stacked charts and clustered charts
- Line Charts, area charts, Bar Charts
- 100% Stacked Bar & Column Charts
- Map Visuals: Tree, Filled, Bubble
- Card, Funnel, Table, Matrix
- Scatter chart: Play Axis, Labels
- Series cluster & Selections
- Waterfall chart and ArcGIS Maps
- Info graphic, Icons and labels
- Color Saturation, Sentiment colors
- Column Series, Column Axis in Lines
- Join Types: Round Bevel, Miter
- Shapes, Markers, axis, Plot Area
- Display unit, Data colors, shapes
- Series, Custom Series and legends