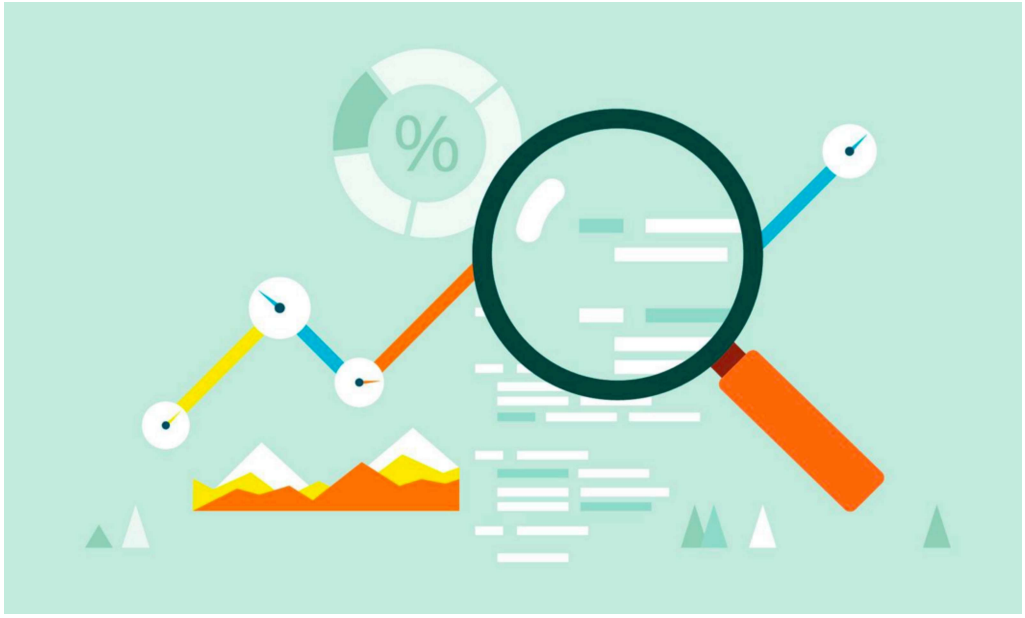
Data Science



Data Visualization ?

Data Visualization

- Data visualization refers to techniques used to communicate insights from data through visual representation.
- It means, presenting data in a visual manner, using charts, graphs and maps.
- Data Visualization is an art of presenting the data in a manner that any non-technical person can understand it.
- It allows data scientists to converse with their end users.

Need of Data Visualization ?

Need of Data Visualization

- To analyze massive amount of data and make decisions based on data
- By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data.
- The amount of information that humans gain through vision is far beyond that of other organs.
- Visualization can help us deal with more complex information and enhance memory.

Importance of Data Visualization

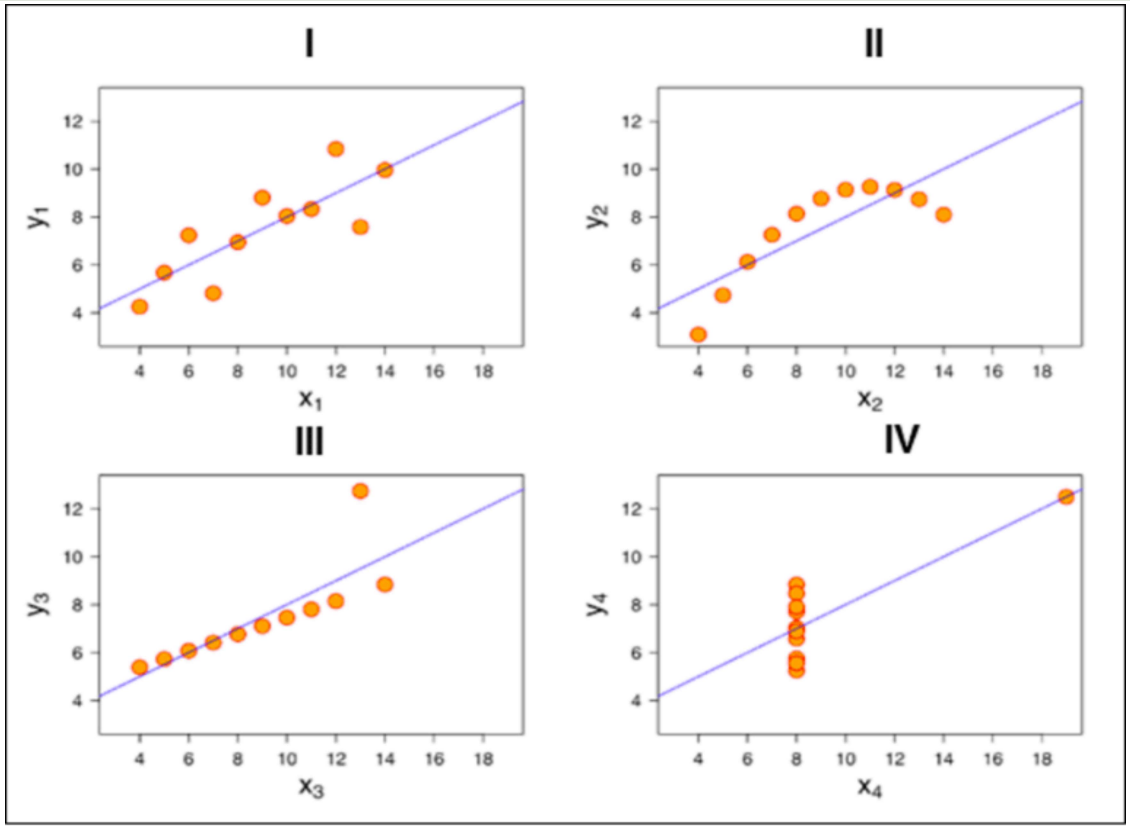
Importance of Data Visualization

- Help in quickly understanding the data
- Simplifies large datasets in a way that people can easily interpret.
- Shows trends that may not be apparent in first glance
- Identify areas that need attention or improvement.
- Offers new insights to your data
- Quickly identify outliers

Example : Anscombe's Quartet

	I		II		III		IV	
	x	y	x	y	x	y	x	y
	10	8,04	10	9,14	10	7,46	8	6,58
	8	6,95	8	8,14	8	6,77	8	5,76
	13	7,58	13	8,74	13	12,74	8	7,71
	9	8,81	9	8,77	9	7,11	8	8,84
	11	8,33	11	9,26	11	7,81	8	8,47
	14	9,96	14	8,1	14	8,84	8	7,04
	6	7,24	6	6,13	6	6,08	8	5,25
	4	4,26	4	3,1	4	5,39	19	12,5
	12	10,84	12	9,13	12	8,15	8	5,56
	7	4,82	7	7,26	7	6,42	8	7,91
	5	5,68	5	4,74	5	5,73	8	6,89
SUM	99,00	82,51	99,00	82,51	99,00	82,50	99,00	82,51
AVG	9,00	7,50	9,00	7,50	9,00	7,50	9,00	7,50
STDEV	3,32	2,03	3,32	2,03	3,32	2,03	3,32	2,03

Example : Anscombe's Quartet



Types of Data Visualization

Types of Data Visualization

- Exploratory Analysis
- Explanatory Analysis

Types of Visualization

Exploratory Analysis -

- It is done during data analysis to find insights
- This is appropriate when you have a whole bunch of data and you're not sure what's in it.
- Visualizations built for these purposes do not need to be perfect. You are simply looking for patterns.

Explanatory Analysis

- This is done after you find an insight.
- This is appropriate when you already know what the data has to say, and you are trying to tell that story to somebody else.
- Visualizations done for these purposes need to be surrounded by a story that points the reader to an insight that answers the question.

Types of Visualization

- Exploratory Analysis -
  - Find insights
- Explanatory Analysis
  - Present insights

Ways of Data Visualization

Different Ways of Data Visualization

- Python, R
  - Ability to generate complex and attractive statistical graphics in order to gain insights and explore our data
  - Equipped to handle millions of data points
  - Most popular languages for data analysis
- Excel
  - Offers large number of charts and graphing tool to create quick visualizations
- Tableau
  - Master of data visualization tools and has a huge customer base
  - A big data visualization tool generally used in many corporates
  - Drag and drop and very easy to use software
  - Quickly create interactive visualizations out of large data

Different Ways of Data Visualization

- Power BI
  - A visualization tool developed by Microsoft
  - Allows to connect to different data sources
- Google Charts
  - Google Charts runs on HTML5 and SVG
  - It is a powerful, easy to use and an interactive data visualization tool for browsers and mobile devices.
  - It aims at Android, iOS and total cross-browser compatibility, including older Internet Explorer versions
  - It has a rich gallery of charts and very easy you to customize as per the needs

Different Ways of Data Visualization

- Qlikview
  - Competitor of Tableau
  - In addition to data visualization capabilities, it offers powerful business intelligence, analytics and enterprise reporting capabilities.
- Infogram
  - It is a web-based data visualization and infographics tool that allows users to create and share digital charts, infographics, and maps.
  - It has an intuitive editor known as WYSIWYG (What You See is What You Get) editor transforms users' data into shareable infographics.
  - It lets you link their visualizations and infographics to real time big data
- And many others