Introduction to Data Visualization

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One thing we should know

before we start ...

“Measure the most you can and show the least you can”

- Danique Roefs

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What will We Learn Today?

1. Why Data Visualization?
2. Simple Data Visualization Using Pandas

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Why Data Visualization?

Let’s imagine!

You're analyzing petabyte of datas

You want to implement the best algorithm or method

We can say data are ...

1. Source of truth
2. Exist everywhere
3. Usually abstract (unstructured)
4. Need a medium to reveal the “mystery in their mind”

Data Visualization are ..

1. The graphic representation of data
2. How we can deliver a message to our audience in the best way possible.
3. The combination of science and art

Why is it important?

- Amplifies your messaging
- Provides clearer understanding
- Aids decision analysis

The goals is for ...

1. **Exploratory**

   to uncover a relationship in the data

   to analyze data

2. **Explanatory**

   to communicate a relationship in the data

   to present data

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9 4 8 4 0 4

9 6 5 8 4 9

4 8 7 5 9 3

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4 8 7 5 9 3

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9 4 8 4 0 4

9 6 5 8 4 9

4 8 7 5 9 3

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It can shows different perspective!

Check the table on the right. What do you think about the data?

I		II		III		IV	
x	*y*	*x*	*y*	*x*	*y*	*x*	*y*
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89

Mean & Variance
$\mu X = 9.0, \sigma X = 11$
$\mu Y = 7.5, \sigma Y = 4.125$

Linear Regression
$Y = 0.5X + 3$
$R^2 = 0.67$

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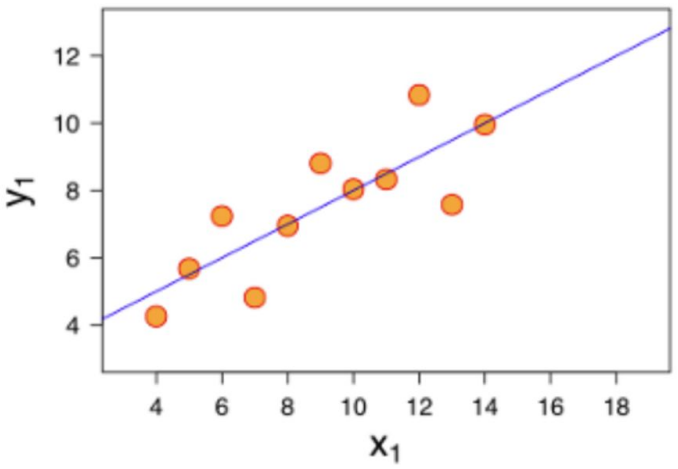
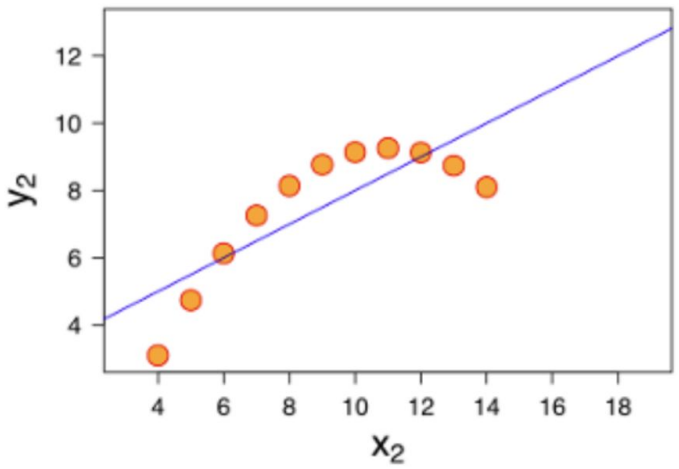
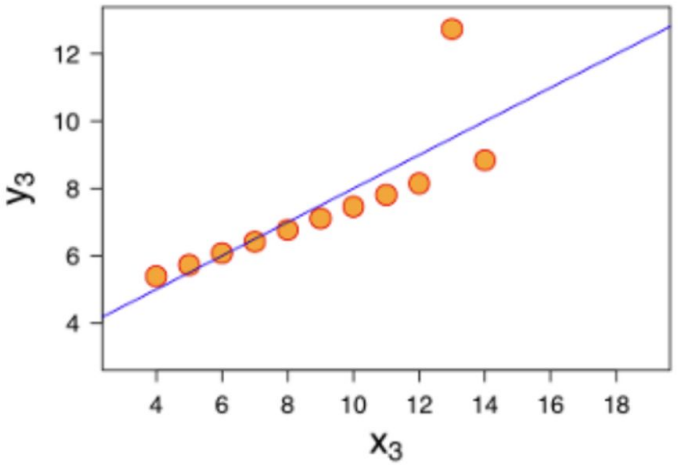
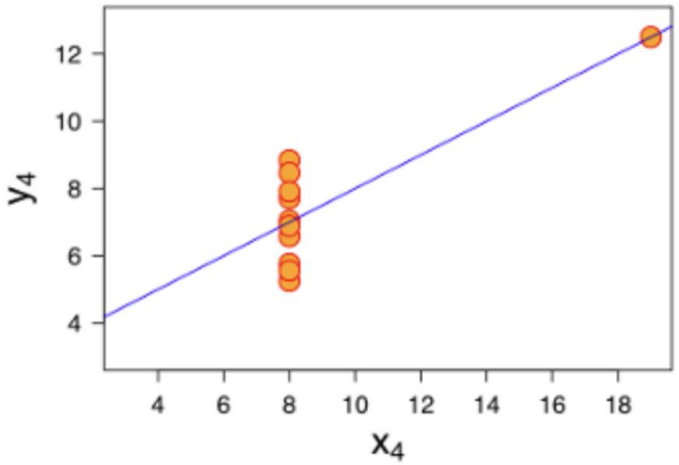
It can shows different perspective!

Datasets from the same statistics can be vastly different and prevent wrong actionables









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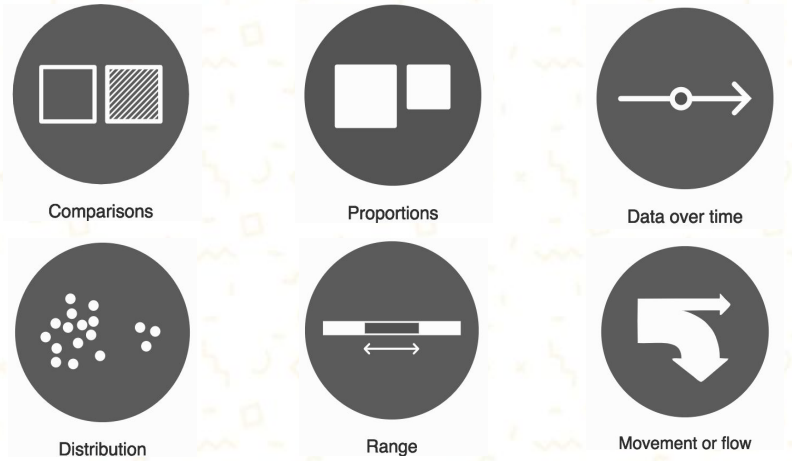
Effective Visualization

Must choose the right fit for the data

1. Define the purpose of the visualization
2. Define important metrics you want to show
3. Choose the right representation



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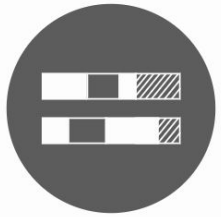
Visualize Proportion

Convey difference/similarity of parts in a whole



Stacked Bar Graph

E.g. “Proportion of transactions per store”

Treemap

E.g. “Proportion of transactions per area”

Pie Chart

E.g. “Proportion of transactions per gender customer”

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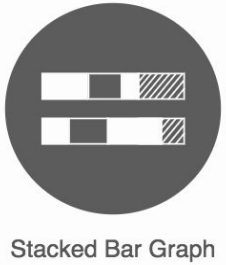
Visualize Comparison

Convey difference/similarity between categories

E.g. “Number of user per segment”



E.g. “Number of purchase happened per product”

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Visualize Over Time Data

Convey changes/trends in a time period

Line Graph

E.g. "# of transacting users per month"

Stacked Area Graph

E.g. "# of transacting users in each store per month"

Bubble Chart

E.g. "# of transacting users in each products per month"

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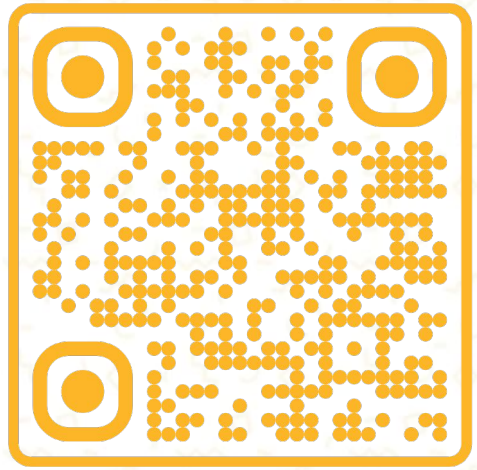
Scan for more Visualization!

scan me



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Simple Visualization Using Pandas

Download the Data Here

Link: https://www.kaggle.com/zynicide/wine-reviews

Data Set Name: winemag-data-130k-v2.csv

Size: 52.91 MB

Link: https://www.kaggle.com/gpreda/iris-dataset

Data Set Name: iris.csv

Size: 4.35 kB

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Thank YOU