DATA SCIENCE

PPGIa/PUCPR

Prof. Jean Paul Barddal

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BIVARIATE PLOTS

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Bivariate plots

- Main goal: verify the existence of relationships in two variables
- The definition of which type of visualization we need to build depends on the variables we are using
  - Scatterplots: two numeric variables
  - Line plots: two numeric variables
  - Box-plots and violin plots: categorical and numeric variables
  - Heatmaps: two numeric variables or one categorical and one numeric

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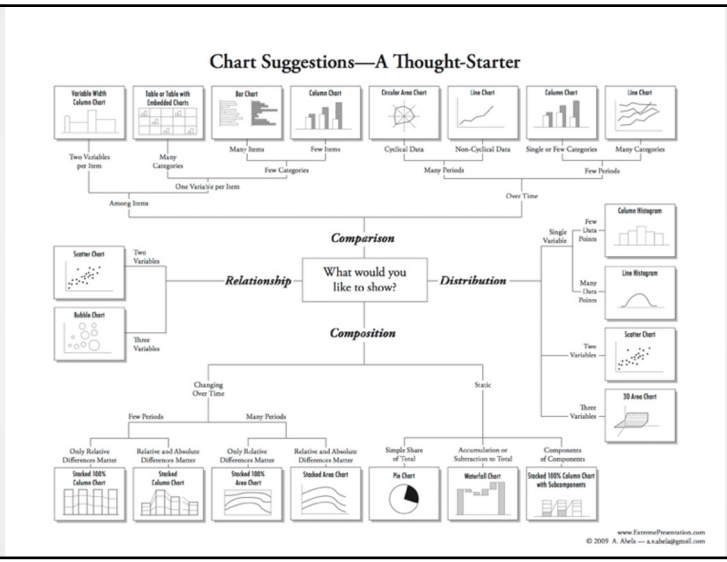

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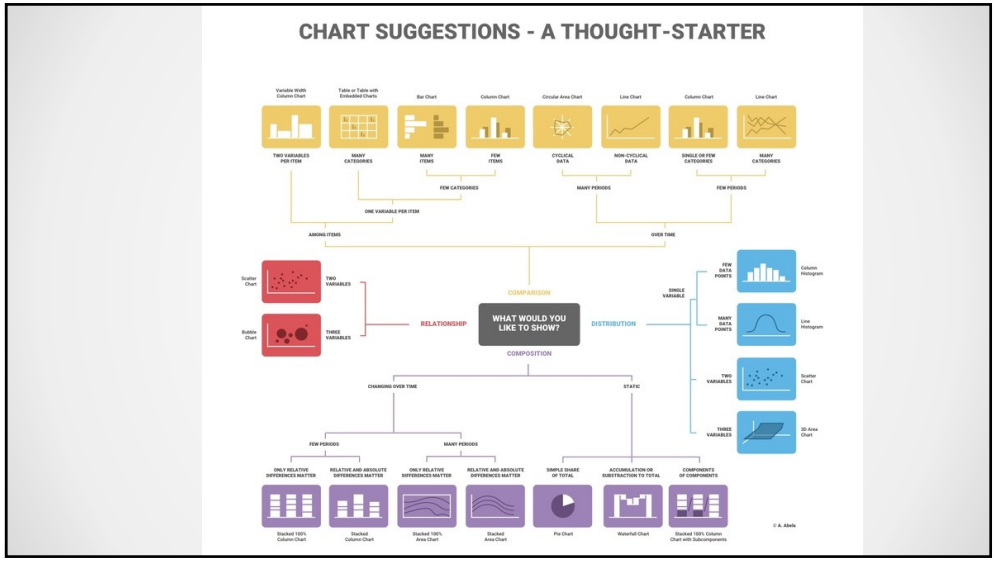

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Important links

- **Datavizcatalogue**
  - https://datavizcatalogue.com
  - "Search by function" option
- Data-to-viz
  - https://www.data-to-viz.com
- **Python Graph Gallery**
  - https://python-graph-gallery.com

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Overplotting, transparency, and jitter

- When creating multivariate plots, it is common for us to have so many data points cluttered in the same region
- This is called **overplotting**, and it prevents us from analyzing the data properly
- A few ideas to handle overplotting:

Marker size	Sampling
Transparency	Filtering
Density	Clustering

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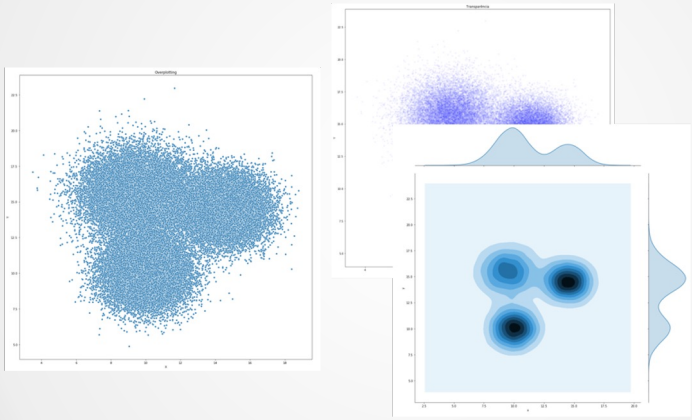
Example - numeric variables



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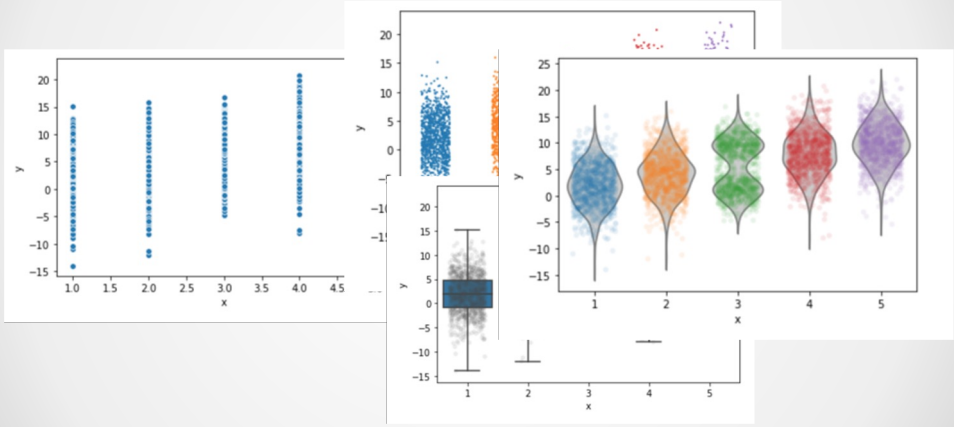
Example - categorical and numeric variables



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DESIGN CHOICES

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Overplotting

- Issue that araises when there are many data points that share the same region in the plot
- Ways to overcome overplotting:
  - *Jitter*
  - *Marker size*
  - *Transparency*
  - *Density*
  - *Sampling*
  - *Filtering*
  - *Clustering*

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Hands-on

- Let's code of the examples of bivariate plots
- And let's also overcome overplotting using the techniques mentioned earlier.

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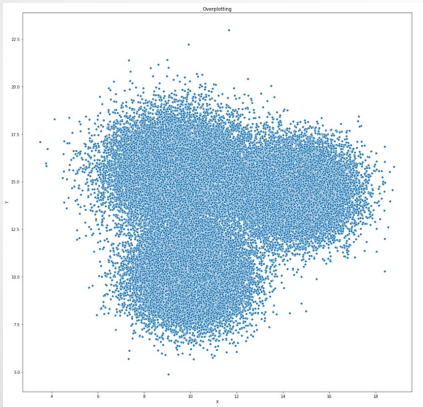
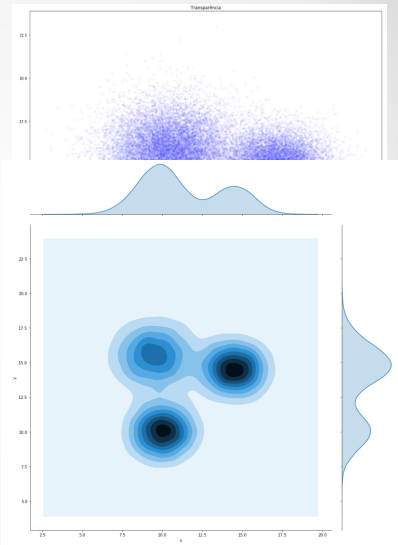
Overplotting examples





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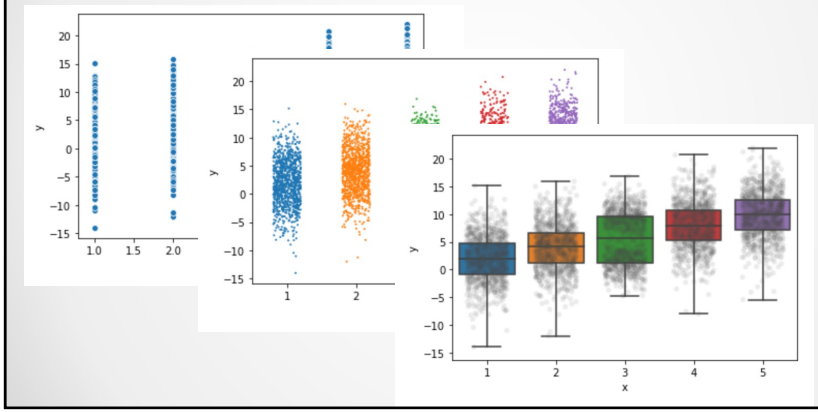
Numeric variable *vs.* categorical variable



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ACTIVITY

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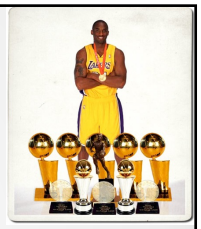
Back to Kobe's shots



- It is time to conduct a data analysis
- Try to work as follows:
- State an hypothesis/question about the data
- Analyze and plot the data
- Discuss the visualization, either by corroborating or invalidating the hypothesis

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