OTHER ELEMENTS IN THE GRAMMAR OF GRAPHICS: FACETS, STATISTICS, COORDINATES, AND THEMES

Dr Alexandra Anderson

7 LAYERS TO THE GRAMMAR OF GRAPHICS

Describes all the non-data ink	Theme
Plotting space for the data	Coordinates
Statistical models & summaries	Statistics
Rows and columns of sub-plots	Facets
Shapes used to represent the data	Geometries
Scales onto which data is mapped	Aesthetics
The actual variables to be plotted	Data

Source: Ganes Kesari (2018) My Talk on Grammar of Graphics: The Secret Sauce of Powerful Data Stories

FACETS

FACETS

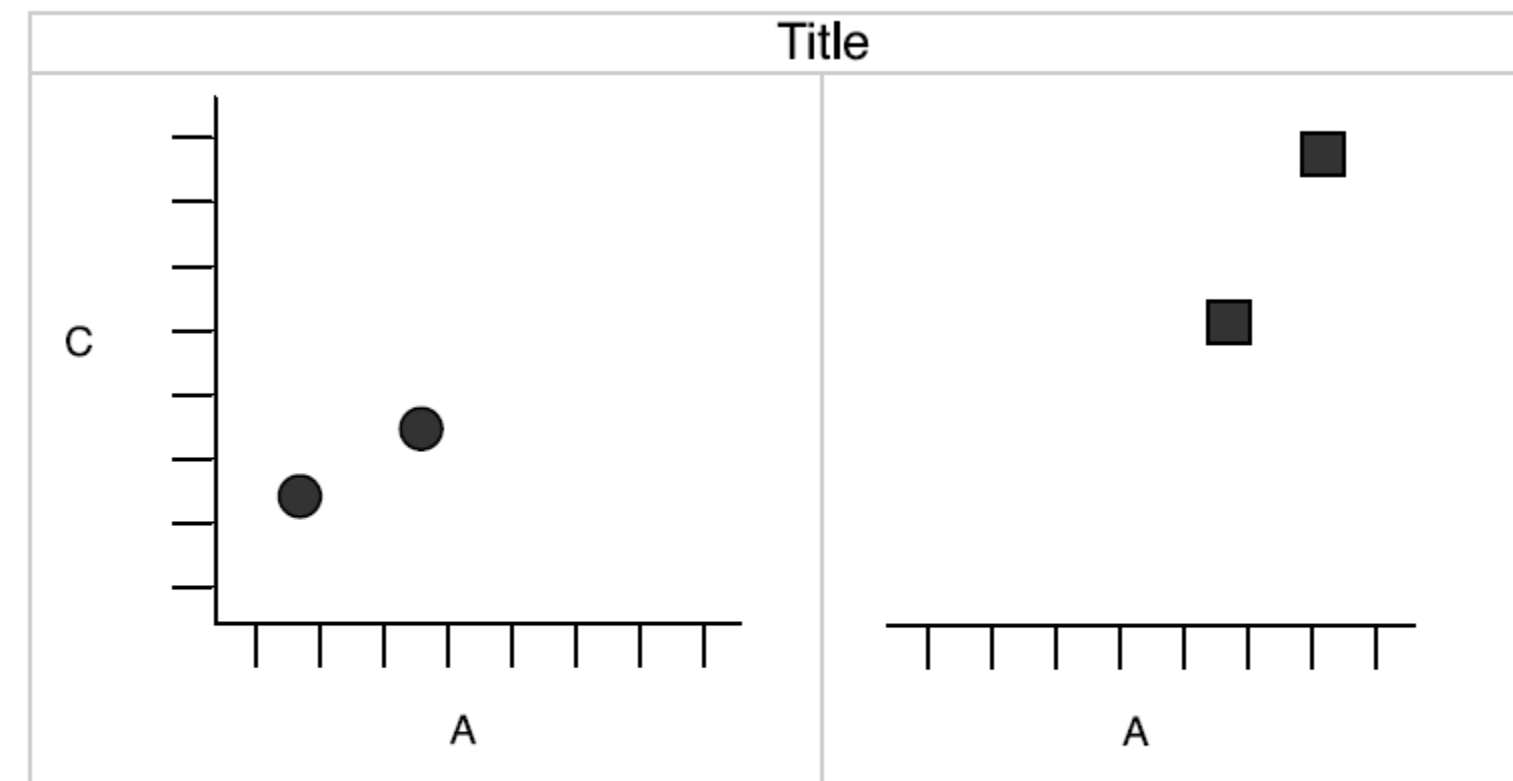Data split into subplots based on an individual variable.


Figure 3. A more complicated plot, faceted by variable *D*. Here the faceting uses the same variable that is mapped to shape so that there is some redundancy in our visual representation. This allows us to easily see how the data have been broken into panels.

Source: Wickham, H. (2012) A Layered Grammar of Graphics. *Journal of Computational and Graphical Statistics* 19(1) 3–28.

FACETS
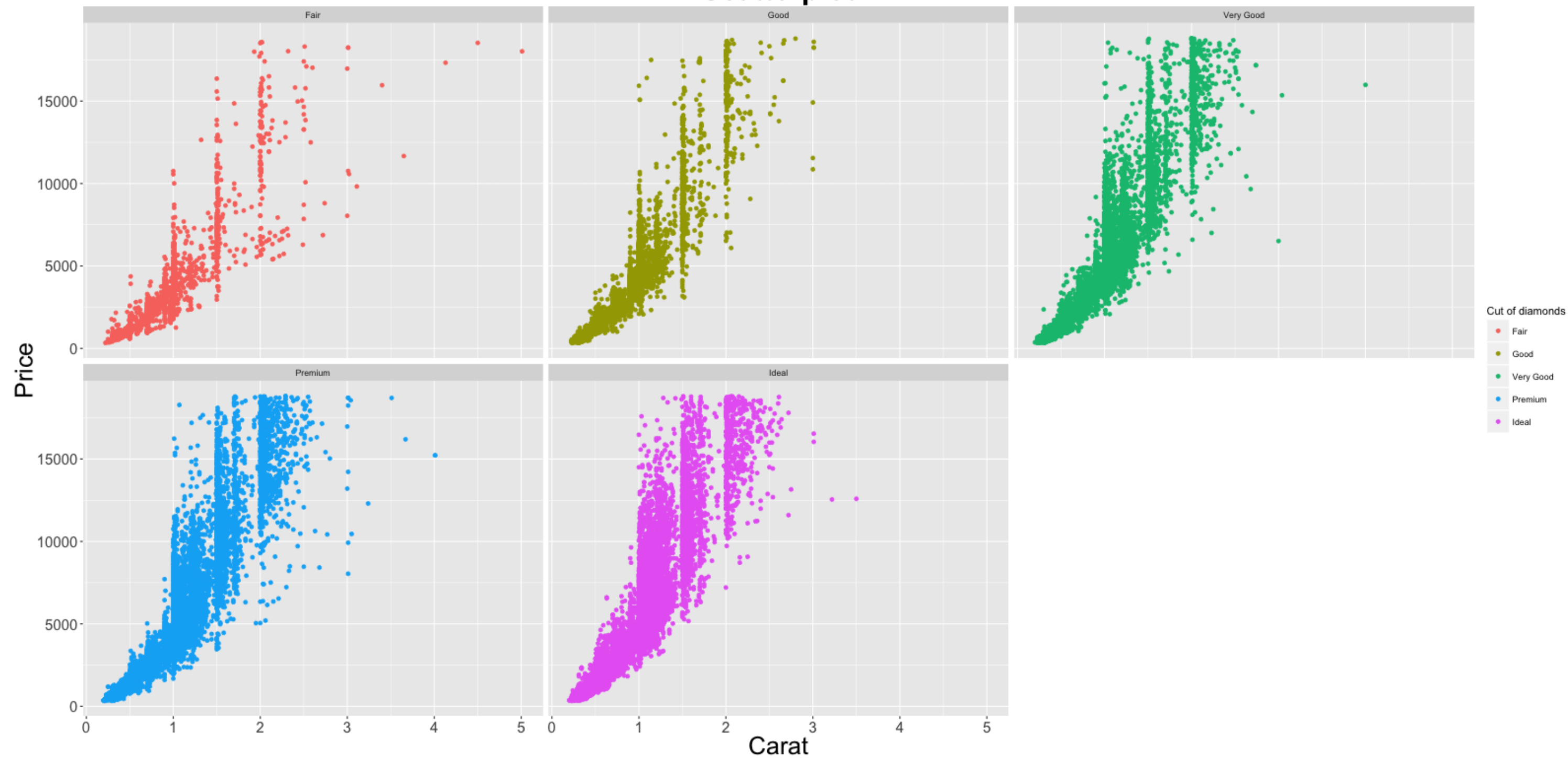
STATISTICS

STATISTICS

A way to introduce statistical models and summaries. Ex: mean, median, distributions.

Table from Wickham, H. (2012) A Layered Grammar of Graphics. *Journal of Computational and Graphical Statistics* 19(1) 3–28.

STATISCAL TRANSFORMATIONS WE CAN DO IN GGPLOT

NAME	DESCRIPTION
bin	Divide continuous range into bins, and count number of points in each
boxplot	Compute statistics necessary for boxplot
contour	Calculate contour lines
density	Identity transformation, $f(x) = x$
jitter	Jitter values by adding small random value
qq	Calculate values for quantile-quantile plot
quantile	Quantile regression
smooth	Smoothed conditional mean of y given x
summary	Aggregate values of y for given x
unique	Remove duplicated observations

COORDINATES

COORDINATES

The coordinate system that maps the position of objects onto the plane of the plot.
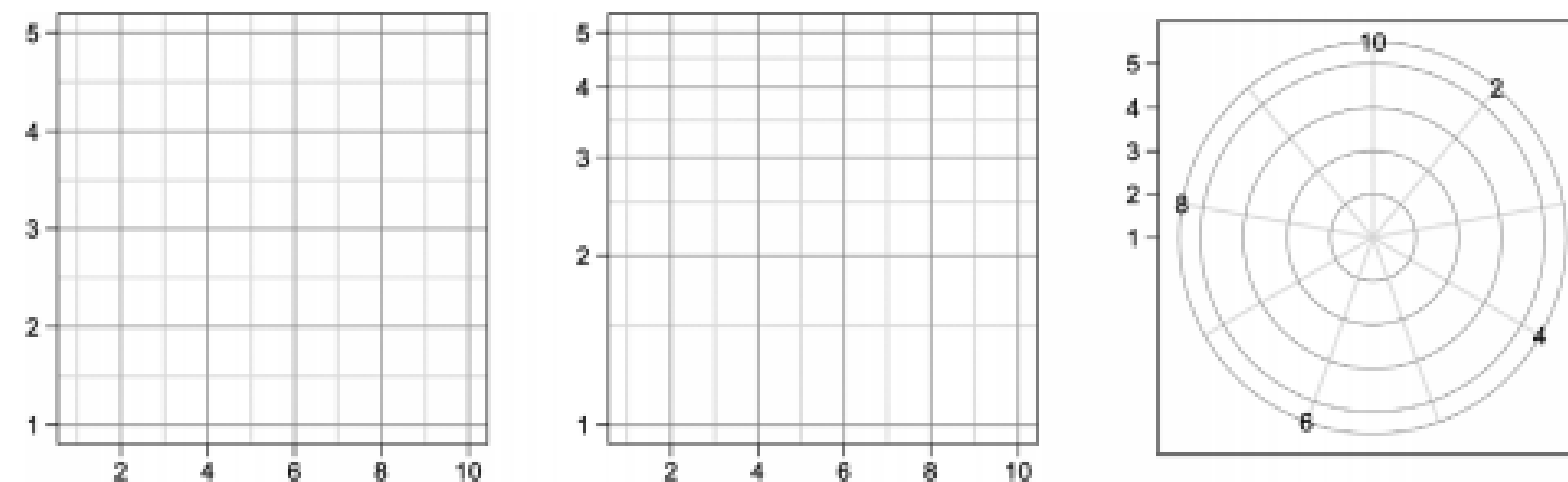

Figure 8.   Examples of axes and grid lines for three coordinate systems: Cartesian, semi-log, and polar. The polar coordinate system illustrates the difficulties associated with non-Cartesian coordinates: it is hard to draw the axes well.

Source: Wickham, H. (2012) A Layered Grammar of Graphics. *Journal of Computational and Graphical Statistics* 19(1) 3–28.

THEMES

THEMES

Where we add any non-data ink.
Examples: labels, chart titles, axes
titles.
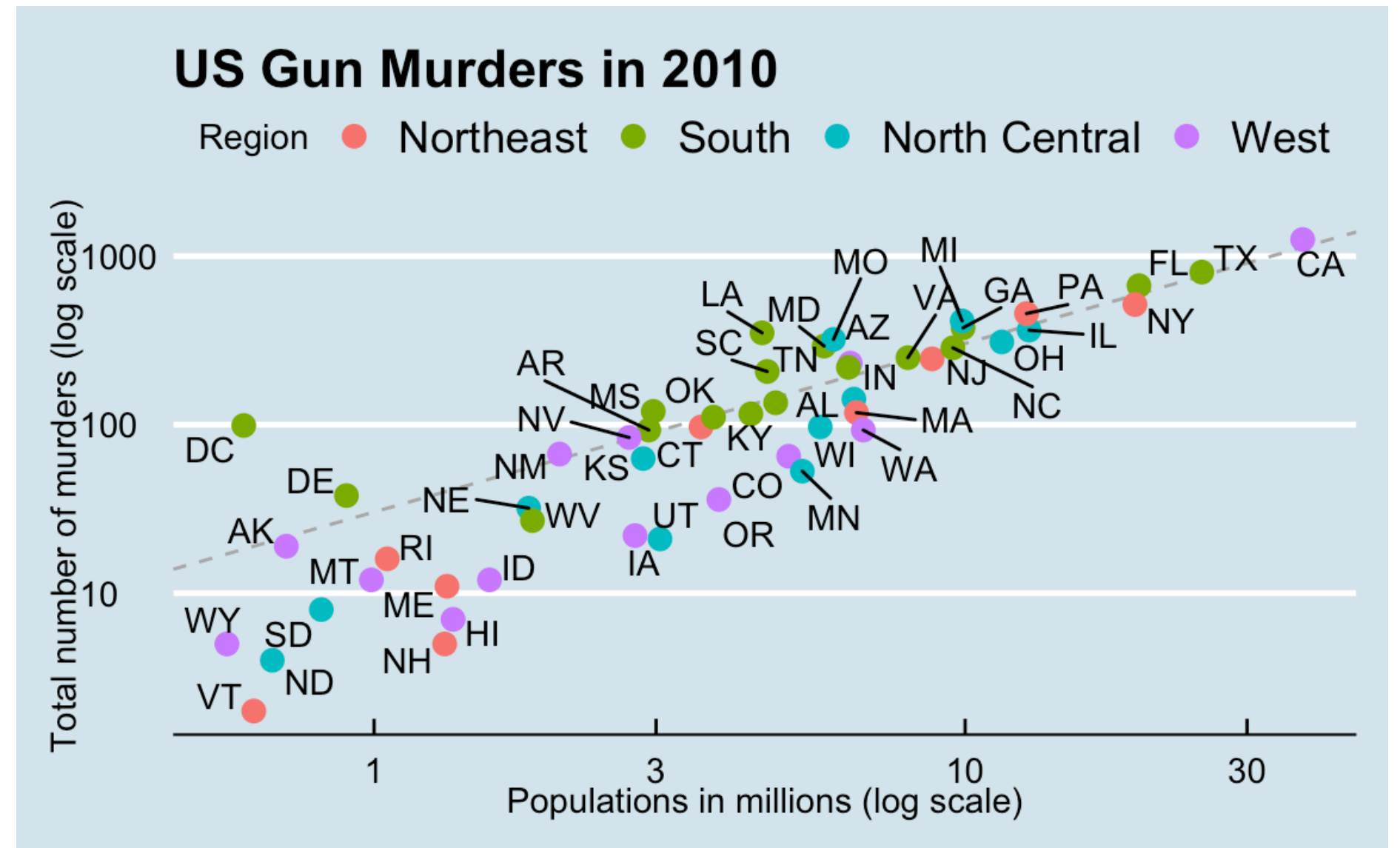
Source: Professor Rafael Irizarry (2019) *Introduction to Data Science*