

# Visualization Fundamentals

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# Data types

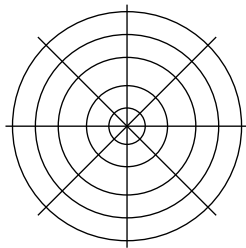
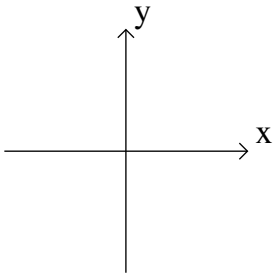
Type	Examples	Appropriate scale	Description
Quantitative/numerical continuous	1.2, $4.2 * 10^{30}$ , 83	Continuous	Integer, real, complex
Quantitative/numerical discrete	1,2,3,4	Discrete	Mostly integers, but also as a result of mapping real to discrete
Qualitative/categorical unordered	bed/milk/bourbon, urban/rural	Discrete	No inherent order. Also called factors
Qualitative/categorical ordered	good/fair/poor	Discrete	Also called ordered factors
Date or time	10.00, Oct. 10 1981	Continuous or discrete	
Text	Hello to the world	None or discrete	Free-form. Can be treated as discrete

# Aesthetics

Position



Examples: Cartesian and polar coordinate systems



Continuous or discrete data

# Aesthetics

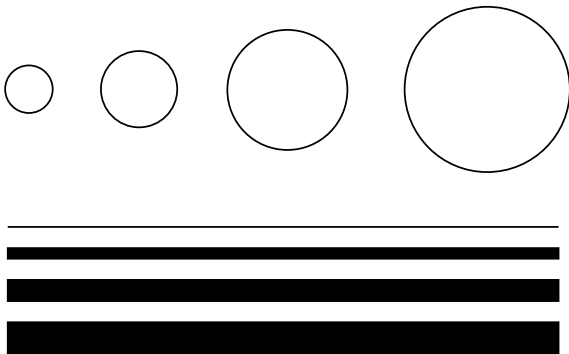
## Shape



Discrete data

# Aesthetics

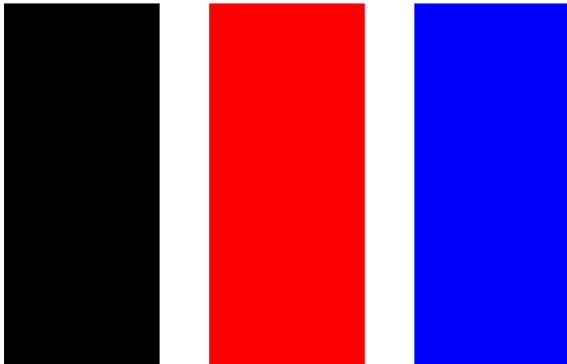
## Size



Continuous or discrete data

# Aesthetics

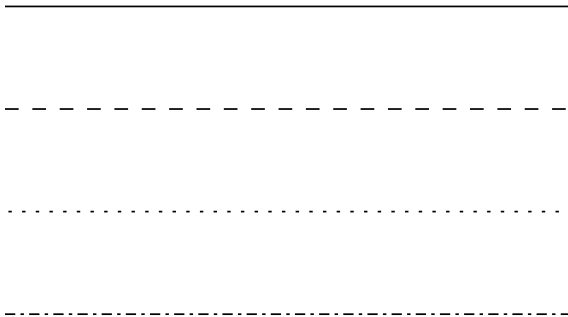
## Color



Continuous (gradient) and discrete data

# Aesthetics

## Line types

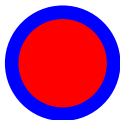
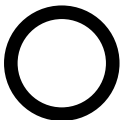
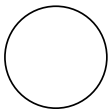


Discrete data

# Aesthetics

Additional as often used in visualization terminology

- ▶ alpha (transparency)
- ▶ stroke (width of boundary of object)
- ▶ color (color of boundary of object)
- ▶ fill (color or pattern inside object)







# Talking about visualization

**ugly** —A figure that has aesthetic problems but otherwise is clear and informative.

**bad** —A figure that has problems related to perception; it may be unclear, confusing, overly complicated, or deceiving.

**wrong** —A figure that has problems related to mathematics; it is objectively incorrect.

# Reference



Claus O. Wilke

Fundamentals of Data Visualization

<https://serialmentor.com/dataviz/index.html>