

Variable Recognition:

- Interval: real numbers such as heights, weights, incomes, and distances
 - o *Quantitative or numerical*
 - o Values are real numbers
 - o All calculations are valid
 - o Data may be treated as ordinal or nominal
- Ordinal: appear to be nominal but the difference is that the order of their value has meaning
 - o Values must represent the ranked order of the data
 - o Calculations based on an ordering process are valid
 - o Data may be treated as nominal but not as interval
 - o ex: poor = 1, fair = 2, good = 3, etc. → numbers have meaning
- Nominal: categories; often have numbers arbitrarily assigned to them
 - o *Qualitative or categorical*
 - o Values are arbitrary numbers that represent categories
 - o Only calculations based on the frequencies or percentages of occurrence are valid
 - o Data may not be treated as ordinal or interval
 - o ex: 1 = married, 2 = widowed, 3 = single etc. → arbitrary numbers

	Interval Data	Nominal Data
Single Variable	Stem and leaf, histogram, ogive	Frequency/relative frequency tables, bar and pie charts
Two Variables	Scatter plot	Cross-classification table, bar chart

Numerical Displays

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| <ul style="list-style-type: none"> • Mean <ul style="list-style-type: none"> o Single set of data o Interval o Central location • Median <ul style="list-style-type: none"> o Single set of data o Ordinal or interval (extreme observations) o Central location | <ul style="list-style-type: none"> • Mode <ul style="list-style-type: none"> o Single set of data o Nominal, ordinal, interval • Geometric Mean <ul style="list-style-type: none"> o Single set of data o Interval; growth rates • Coefficient of correlation <ul style="list-style-type: none"> o Two variables o Interval |
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Standard deviation: $\sigma = \sqrt{\sigma^2}$

Measures of Variability: range, variance, standard deviation, and coefficient of variation

IQR: $Q_3 - Q_1$

Percentile: $L_p = (n+1)P/100$ L_p is p^{th} percentile