

Notes: Friday January 11, 2013

$$\text{Mean: } \bar{Y} = \frac{\sum Y_i}{n}$$

$$\text{Expected value: } \sum_{i=0}^n Y_i P_i$$

Mean, Median, Mode

Problems with means: They don't accurately describe nominal—binary/Bernouli, or ordinal variables

Median: is best use for ordinal variables or when interval ranges are skewed by outliers

Mode: can be used for all variable types, works well with nominal variables

Variance

$$\text{Deviation: } (y_i - \bar{Y})$$

$$\text{Variance: } (var)Y = \frac{\sum_{i=0}^n (y_i - \bar{Y})^2}{n-1}$$

$$\text{Standard Deviation: } s = \sqrt{\frac{\sum_{i=0}^n (y_i - \bar{Y})^2}{n-1}}$$

Standard Deviations are always positive

Moments

Mean	1 st moment	(Y ¹)
Variance	2 nd moment	(Y ²)
Skewness	3 rd moment	(Y ³)
Kurtosis	4 th moment	(Y ⁴)

Symbols:

	Population	Sample
Mean	μ_y	\bar{Y}
Standard deviation	σ	s

Conditional Distribution

$$\Pr(Y = y \mid X = x) = \frac{\Pr(X = x, Y = y)}{\Pr(X = x)}$$