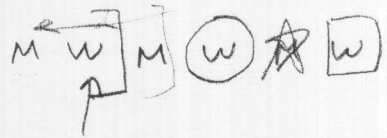


Quizzes/Exams



You
are
here

1) Mean is a measure of CENTER
Variance " " " " " SPREAD

$$2) \sigma^2 \geq 0 \quad \sum_{i=1}^n (x_i - \mu)^2 f(x_i)$$

$$3) \sigma = \sqrt{\sigma^2}$$

is the STANDARD DEVIATION

Note:

SHORTCUT

$$\sigma^2 = \sum (x_i - \mu)^2 f(x_i)$$

$$= \sum (x_i^2 - 2\mu x_i + \mu^2) \cdot f(x_i)$$

$$= \sum \left[x_i^2 f(x_i) - 2\mu x_i f(x_i) + \mu^2 f(x_i) \right]$$

$$= \sum x_i^2 f(x_i) - 2\mu \sum x_i f(x_i) + \mu^2 \sum f(x_i)$$

$$= \sum x_i^2 f(x_i) - 2\mu^2 + \mu^2(1)$$

$$\sigma^2 = \sum x^2 f(x) - \mu^2$$

Do an experiment n times,

observe values x_1, x_2, \dots, x_n

↓
sample

Defn: The EMPIRICAL

DISTRIBUTION is the pmf that puts mass $\frac{1}{n}$ on each of the values x_1, \dots, x_n .

The MEAN of the $(EDist^n)$

$$\mu = \sum_{i=1}^n x_i f(x_i)$$

$$= \sum_{i=1}^n x_i \cdot \left(\frac{1}{n}\right)$$

$$= \frac{1}{n} \sum_{i=1}^n x_i = \frac{1}{n} (x_1 + \dots + x_n)$$

$$\begin{aligned} \bar{x} &= \text{SAMPLE MEAN} \\ &= \text{"x bar"} \\ &= \text{average} \end{aligned}$$

Variance of the $EDist^n$

$$\sigma^2 = \sum_{i=1}^n (x_i - \bar{x})^2 \cdot \frac{1}{n}$$

SAMPLE VARIANCE

$$S^2 = \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2$$

SAMPLE STANDARD DEVIATION

$$S = \sqrt{S^2}$$

Computing Formulas

Data Types

8/25/10

Quantitative — numbers

Qualitative → not numbers

Number of Pets Hometown Phone #
Height/Weight Hat Prefs SSN
Commute Dist Ethnicity Shoe Size
Income Dom. Hand
BAC Side out of Bed
Rebt level Fav. Color
Wind speed Political Party
RH Fav. type of _____
Age
of $\frac{\text{Pets} + \text{Hair strand}}{\text{Siblings}}$

Quantitative

Qualitative