

Measures of Relative Standing (Position)

Section 3-4

Measures of Relative Standing (Position)

❖ **z Score** (or standard score)

the number of standard deviations
that a given value x is above or below
the mean

Measures of Position **z score**

Sample

$$z = \frac{x - \bar{x}}{s}$$

Measures of Position z score

Sample

Population

$$z = \frac{x - \bar{x}}{s}$$

$$z = \frac{x - \mu}{S}$$

Measures of Position z score

Sample

Population

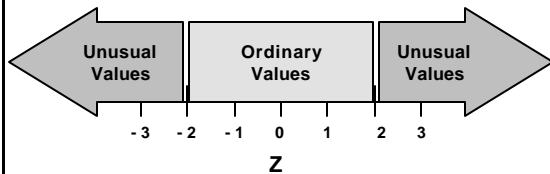
$$z = \frac{x - \bar{x}}{s}$$

$$z = \frac{x - \mu}{S}$$

Round to 2 decimal places

FIGURE 3-5

Interpreting Z Scores



Other Measures of Position

Quartiles Percentiles

Quartiles

Quartiles

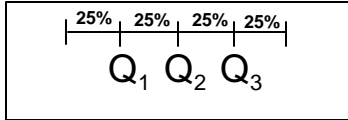
Q_1, Q_2, Q_3

divides ranked scores into four equal parts

Quartiles

Q_1, Q_2, Q_3

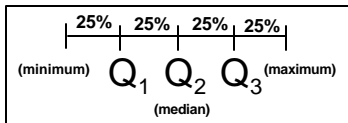
divides ranked scores into four equal parts



Quartiles

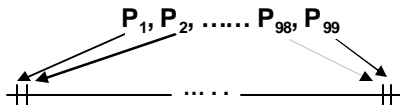
Q_1, Q_2, Q_3

divides ranked scores into four equal parts

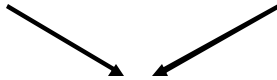


Percentiles

99 Percentiles

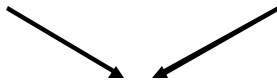


Quartiles and Percentiles



Fractiles

Quartiles and Percentiles



**Fractiles
(Quantiles)**

partitions data into approximately equal parts

Finding the Percentile of a Given Score

Finding the Percentile of a Given Score

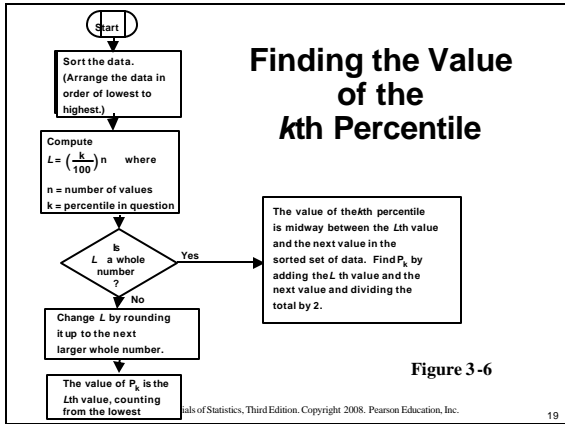
$$\text{Percentile of score } x = \frac{\text{number of scores less than } x}{\text{total number of scores}} \cdot 100$$

Finding the Score Given a Percentile

Finding the Score Given a Percentile

$$L = \frac{k}{100} \cdot n$$

n total number of values in the data set
 k percentile being used
 L locator that gives the *position* of a value
 P_k k th percentile



Quartiles

$Q_1 = P_{25}$

$Q_2 = P_{50}$

$Q_3 = P_{75}$

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