

# Percentiles

Goal:

- to calculate the percentile of a value in a data set
- to interpret the percentile of a value in a data set
- to find a value in an ordered set given its percentile

So far we have looked at measures of dispersion (range and mean deviation) and the measures of central tendency (mean, median and mode).

A third category of statistical measure is measures of position.

Measure of position include quartiles — divides into four groups

and quintiles — divides into 5 groups. Another is percentiles — divides data into 100 groups

The percentile of a given value is defined as...

the percentage of values worse or equal to that given value.

Percentiles rank values from 1 to 100.

lowest (worst)      highest (best)

The percentile of a given value is calculated by:

$$\text{Percentile rank} = \frac{\# \text{ of values equal or worse}}{\text{total \# of values}} \times 100$$

\* always round up      0.1 = 1<sup>st</sup> percentile  
    49.2 = 50<sup>th</sup> percentile

Ex: In the set

1 2 3 4 . . . . . 10 11 12 13  
 50, 52, 58, 60, 65, 70, 71, 74, 77, 80, 83, 88, 88, 96  
 1 2 3 4 5 6 7 8 9 10 11

a) find the percentile rank of 77.

$$\begin{aligned} \text{Percentile rank} &= \frac{9}{14} \times 100 \\ &= 64.28 \\ &65^{\text{th}} \text{ percentile} \end{aligned}$$

b) find the percentile rank of 88.

$$\begin{aligned} \text{Percentile rank} &= \frac{13}{14} \times 100 \\ &= 92.8 \\ &93^{\text{rd}} \text{ percentile} \end{aligned}$$

c) find the value with a percentile of 79.

$$79 = \frac{\# \text{ of values worse or equal}}{14} \times 100$$

$$14 \cdot 79 = \frac{x}{14} \cdot 100$$

$$\frac{1106}{100} = \frac{100x}{100}$$

$$11.06 = x$$

→ there are 11 values worse or equal to it.

83 is in the 79<sup>th</sup> percentile

Homework: p. 83 # 3-6, 11, 14,  
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