Ch 2.6 Measures of Position

Measures of central tendency - data in the middle

Measures of Dispersion-how the data is spread out

Measures of Position-look at where the scores sit in the set of data

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Ex1) If you took a test in English and got a 85 B- and you took a test in Stats and got 80 C, which test did you do better on?

If I told you that the $\bar{x}$ on the English test was a 92 B+ and s = 2, and the $\bar{x}$ on the math test was a 79 C and s = 5, would you change your mind and why?

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If you want to compare scores from one test to another, you need to see how you compare to the entire group.

z-scores - converting values into a standard scale

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

Think of the scores similar to standard deviations +/-1, +/-2, and +/-3, etc.

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Ex1) English z-score vs Math z-score

English test you got a 85 with a class mean of a 92 B+ with s = 2

Math test you got an 80 with a class mean of 79 C with s = 5.

Which test did you do relatively better on?

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Ex 1b) Which person is relatively taller Michael Jordan verses Rebecca Lobo?

Mike = 78 inches tall
men's $\bar{x}$ = 69, s = 2.8

Rebecca = 76 inches tall
women's $\bar{x}$ = 63.6, s = 2.5

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Range Rule of Thumb-"unusual" values are more than +/-2 units from the mean.

Ordinary scores: $-2 \leq x \leq 2$

Unusual scores: $z < -2$ or $z > 2$

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Ex 2a)Were Michael and Rebecca's heights unusual?

Ex 2b) Is Mugsy Bogues' height unusual, if he is 5 ft 3 inches tall?

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1 **Is Mrs. Schnowske's height of 5ft unusal for a women ?**

Yes

No

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Ex 2c) If a women has a z-score of 1.5, what is her height?

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Quartiles or fractiles are where the data is partitioned into approximately equal parts.

Quartiles, deciles, and percentiles are examples.

Quartiles: Q_1, Q_2, and Q_3 Deciles: D_1, D_2, D_3.....D_9 Percentiles: P_1, P_2, P_3,.....P_{99}

divides data into 4 groups divides data intio 10 groups divides data into 100 groups

On a lot of the state testing, your results are in percentile ranking.

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Percentile = $\frac{\text{\# of values less than x}}{\text{total values in the data set}} \cdot 100$

Open your book to page 87

Ex 3a) Find the perctile that corresponds w/ 0.8143.

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Ex 3b) Find the percentile for a can that weights 0.8161.

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When given the percentile ranking and want to find the score use this formula.

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

k = percentile ranking

n = total # values in the set of data

If L = a decimal round it up and it tells how many scores to count in the set of data. If it is a whole number, find the average of that number and the next consecutive number in the set of data.

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Ex 4a) Find the weight that would be in 25th percentile or P_{25}.

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Ex 4b) Find P_{45}?

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1 Find the percentile for a coke can that weighs 0.8194.

Round to the nearest percent.

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2 Find the Coke can that is in the 50th Percentile.

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Percentiles and Deciles use the same formulas

Find $D_4 = P_{40}$

*There are discrepencies between the deciles and percentiles. The larger the grouping the smaller the discrepency. D_4 and P_{36} were both 0. 8161.

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Figure Quartiles just like percentiles:

Ex) $P_{25} = Q_1$, $P_{50} = Q_2$, $P_{75} = Q_3$

Q_1= Seperates the bottom 25% of the sorted values from the top 75%

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Q_2 = median of the set of data. Divides the top and bottom 50%.

Q_3 = Seperates the bottom 75% from the top 25%.

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Interquartile range or IQR= $Q_3 - Q_1$

Semi interquartile range = $\frac{Q_3 - Q_1}{2}$

Midquartile = $\frac{Q_3 + Q_1}{2}$

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2 Find Q_3 from the Coke Table:

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