

Basketball Rosters



Panthers		Tartans	
Laura	183	Sam	166
Jamie	165	Shannon	163
Deepa	148	Tracy	168
Colleen	146	Claudette	161
Ingrid	181	Maria	165
Justiss	178	Amy	166
Sheila	154	Selena	166

Calculate the mean height for each team.

$$\mu = 165$$



$$\mu = 165$$



Which team has the height advantage?



Measures of Spread

The variance and standard deviation are measures that indicate how closely the data clusters around its center.

The variance and standard deviation of a sample may differ from those of the population the sample is drawn from.

	Population	Sample
Standard Deviation	$\sigma = \sqrt{\frac{\sum_{i=1}^n (X_i - \mu)^2}{N}}$ <p><i>low measure for how far the data is from the mean on average.</i></p>	$s = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$ <p><i>mean</i></p>
Variance	$\sigma^2 = \frac{\sum_{i=1}^n (X_i - \mu)^2}{N}$	$s^2 = \frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}$
	<p>Where X are the individual values, μ is the mean of the population, and N is the total number of data values in the population</p>	<p>Where X are the individual values, \bar{X} is the mean of the sample, and n is the total number of data values in the sample.</p>

* The standard deviation can be used as a measure of how meaningful any particular average is. A large standard deviation means that the average is not reliable as a representation of what a normal piece of data looks like.

Example Find the standard deviation of each basketball team

Panthers			Tartans		
X	X - μ	(X - μ) ²	X	X - μ	(X - μ) ²
183	183 - 165 = 18	324	166	1	1
165	165 - 165 = 0	0	163	-2	4
148	-17	289	168	3	9
146	-19	361	161	-4	16
181	16	256	165	0	0
178	13	169	166	1	1
154	-11	121	166	1	1
Total		1520	Total		32
		$\sigma = \sqrt{\frac{1520}{7}}$			$\sigma = \sqrt{\frac{32}{7}}$
		$\sigma = 14.7$			$\sigma = 2.1$

Measures of Spread

QUARTILES AND INTERQUARTILE RANGES

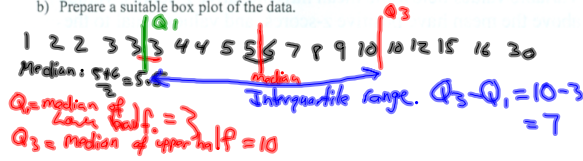
Quartiles divide a set of ordered data into four groups with equal numbers of values, just as the median divides data into two equally sized groups. The three "dividing points" are the first quartile (Q_1), the median or second quartile (Q_2), and the third quartile (Q_3). Q_1 and Q_3 are the medians of the lower and upper halves of the data.

Example:

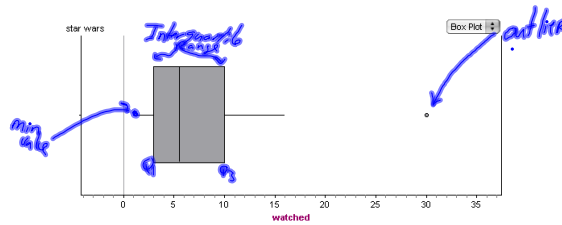
A random survey of people at a science-fiction convention asked them how many times they had seen Star Wars. Here are the results:



- Determine the median, the first and third quartiles, and the interquartile and semi-interquartile ranges.
- Prepare a suitable box plot of the data.



A box plot illustrates these values



Homework

complete the fathom file for Measures of Spread.

Attachments

BasketballRoster.ftm