

1. Problem

From a very large population, a small sample of measurements was taken.

199	189	193	201
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Please calculate the average absolute deviation using the following formula:

$$AAD = \frac{\sum |x - \bar{x}|}{n}$$

Solution

We fill out the table column by column.

x	$x - \bar{x}$	$ x - \bar{x} $
199	3.5	3.5
189	-6.5	6.5
193	-2.5	2.5
201	5.5	5.5
=====	=====	=====
$\sum x = 782$		$\sum x - \bar{x} = 18$
$\bar{x} = 195.5$		

We are ready for the formula.

$$s = \frac{\sum |x - \bar{x}|}{n}$$

$$= \frac{18}{4}$$

$$= \boxed{4.5}$$

2. Problem

From a very large population, a small sample of measurements was taken.

153	137	142	135	143
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Please calculate the (Bessel corrected) sample standard deviation using the following formula:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

Solution

We fill out the table column by column.

x	$x - \bar{x}$	$(x - \bar{x})^2$
153	11	121
137	-5	25
142	0	0
135	-7	49
143	1	1
=====	=====	=====
$\sum x = 710$		$\sum (x - \bar{x})^2 = 196$
$\bar{x} = 142$		

We are ready for the formula.

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

$$= \sqrt{\frac{196}{5 - 1}}$$

$$= \sqrt{49}$$

$$= \boxed{7}$$