

1. Problem

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

115	127	103	115	122
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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} $
115	-1.400000000000001	1.4
127	10.6	10.6
103	-13.4	13.4
115	-1.400000000000001	1.4
122	5.599999999999999	5.6
=====	=====	=====
$\sum x = 582$		$\sum x - \bar{x} = 32.4$
$\bar{x} = 116.4$		

We are ready for the formula.

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

$$= \frac{32.4}{5}$$

$$= \boxed{6.48}$$

2. Problem

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

86	82	82	88
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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	$x - \bar{x}$	$(x - \bar{x})^2$
86	1.5	2.25
82	-2.5	6.25
82	-2.5	6.25
88	3.5	12.25
=====	=====	=====
$\sum x = 338$		$\sum (x - \bar{x})^2 = 27$
$\bar{x} = 84.5$		

We are ready for the formula.

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

$$= \sqrt{\frac{27}{4 - 1}}$$

$$= \sqrt{9}$$

$$= \boxed{3}$$