

1. Problem

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

44	51	53	42
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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} $
44	-3.5	3.5
51	3.5	3.5
53	5.5	5.5
42	-5.5	5.5
=====	=====	=====
$\sum x = 190$		$\sum x - \bar{x} = 18$
$\bar{x} = 47.5$		

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.

54	54	58	54
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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	$x - \bar{x}$	$(x - \bar{x})^2$
54	-1	1
54	-1	1
58	3	9
54	-1	1
=====	=====	=====
$\sum x = 220$		$\sum (x - \bar{x})^2 = 12$
$\bar{x} = 55$		

We are ready for the formula.

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

$$= \sqrt{\frac{12}{4 - 1}}$$

$$= \sqrt{4}$$

$$= \boxed{2}$$