

1. Problem

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

71	63	65	63	77
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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} $
71	3.2	3.2
63	-4.8	4.8
65	-2.8	2.8
63	-4.8	4.8
77	9.2	9.2
=====	=====	=====
$\sum x = 339$		$\sum x - \bar{x} = 24.8$
$\bar{x} = 67.8$		

We are ready for the formula.

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

$$= \frac{24.8}{5}$$

$$= \boxed{4.96}$$

2. Problem

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

125	125	131	125
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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	$x - \bar{x}$	$(x - \bar{x})^2$
125	-1.5	2.25
125	-1.5	2.25
131	4.5	20.25
125	-1.5	2.25
=====	=====	=====
$\sum x = 506$		$\sum (x - \bar{x})^2 = 27$
$\bar{x} = 126.5$		

We are ready for the formula.

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

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

$$= \sqrt{9}$$

$$= \boxed{3}$$