

1. Problem

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

100	102	103	101
-----	-----	-----	-----

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} $
100	-1.5	1.5
102	0.5	0.5
103	1.5	1.5
101	-0.5	0.5
=====	=====	=====
$\sum x = 406$		$\sum x - \bar{x} = 4$
$\bar{x} = 101.5$		

We are ready for the formula.

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

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

$$= \boxed{1}$$

2. Problem

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

163	165	164	165	163
-----	-----	-----	-----	-----

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	$x - \bar{x}$	$(x - \bar{x})^2$
163	-1	1
165	1	1
164	0	0
165	1	1
163	-1	1
=====	=====	=====
$\sum x = 820$		$\sum (x - \bar{x})^2 = 4$
$\bar{x} = 164$		

We are ready for the formula.

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

$$= \sqrt{\frac{4}{5 - 1}}$$

$$= \sqrt{1}$$

$$= \boxed{1}$$