

1. Problem

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

183	186	191	184	192
-----	-----	-----	-----	-----

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} $
183	-4.199999999999999	4.2
186	-1.199999999999999	1.2
191	3.800000000000001	3.8
184	-3.199999999999999	3.2
192	4.800000000000001	4.8
=====	=====	=====
$\sum x = 936$		$\sum x - \bar{x} = 17.2$
$\bar{x} = 187.2$		

We are ready for the formula.

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

$$= \frac{17.2}{5}$$

$$= \boxed{3.44}$$

2. Problem

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

98	94	94	94
----	----	----	----

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	$x - \bar{x}$	$(x - \bar{x})^2$
98	3	9
94	-1	1
94	-1	1
94	-1	1
=====		
$\sum x = 380$		$\sum (x - \bar{x})^2 = 12$
$\bar{x} = 95$		

We are ready for the formula.

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

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

$$= \sqrt{4}$$

$$= \boxed{2}$$