1. Problem

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

Please calculate the average absolute deviation using the following formula:

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

Solution

We fill out the table column by column.

X	$X - \bar{X}$	$ x-ar{x} $
129	-11.6	11.6
149	8.40000000000001	8.4
128	-12.6	12.6
136	-4.59999999999999	4.6
161	20.4	20.4
======	======	=======
$\sum x = 703$		$\sum x - \bar{x} = 57.6$
$\bar{x} = 140.6$		

We are ready for the formula.

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

$$=\frac{57.6}{5}$$

2. Problem

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

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	$X - \bar{X}$	$(x-\bar{x})^2$
155	3.5	12.25
149	-2.5	6.25
149	-2.5	6.25
153	1.5	2.25
=======	=======	=======
$\sum x = 606$ $\bar{x} = 151.5$		$\sum (x - \bar{x})^2 = 27$

We are ready for the formula.

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$
$$= \sqrt{\frac{27}{4 - 1}}$$
$$= \sqrt{9}$$
$$= \boxed{3}$$