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} $
57	7.4	7.4
56	6.4	6.4
44	-5.6	5.6
41	-8.6	8.6
50	0.39999999999999	0.4
======	=======	=======
$\sum x = 248$		$\sum x - \bar{x} = 28.4$
$\bar{x} = 49.6$		

We are ready for the formula.

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

$$=\frac{28.4}{5}$$

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	$X - \bar{X}$	$(x-\bar{x})^2$
189	5	25
183	-1	1
196	12	144
175	-9	81
180	-4	16
190	6	36
175	-9	81
======	=======	=======
$\sum x = 1288$		$\sum (x - \bar{x})^2 = 384$
$\bar{x} = 184$		

We are ready for the formula.

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$
$$= \sqrt{\frac{384}{7 - 1}}$$
$$= \sqrt{64}$$
$$= \boxed{8}$$