## 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} $
187	1.19999999999999	1.2
190	4.19999999999999	4.2
179	-6.80000000000001	6.8
183	-2.80000000000001	2.8
190	4.1999999999999	4.2
======	=======	=======
$\sum x = 929$		$\sum  x - \bar{x}  = 19.2$
$\bar{x} = 185.8$		·

We are ready for the formula.

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

$$=\frac{19.2}{5}$$

## 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	$X - \bar{X}$	$(x-\bar{x})^2$
108	4.5	20.25
102	-1.5	2.25
102	-1.5	2.25
102	-1.5	2.25
=======	=======	=======
$\sum x = 414$		$\sum (x - \bar{x})^2 = 27$
$\bar{x} = 103.5$		

We are ready for the formula.

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