## 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} $
110	-4.8	4.8
117	2.2	2.2
120	5.2	5.2
115	0.200000000000003	0.2
112	-2.8	2.8
======	======	=======
$\sum x = 574$		$\sum  x - \bar{x}  = 15.2$
$\bar{x} = 114.8$		

We are ready for the formula.

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

$$=\frac{15.2}{5}$$

## 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	$X - \bar{X}$	$(x-\bar{x})^2$
65	-1	1
67	1	1
67	1	1
65	-1	1
66	0	0
=======	======	=======
$\sum x = 330$ $\bar{x} = 66$		$\sum (x - \bar{x})^2 = 4$

We are ready for the formula.

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$
$$= \sqrt{\frac{4}{5 - 1}}$$
$$= \sqrt{1}$$
$$= \boxed{1}$$