

**1. Solution**

Let  $x$  represent a datum of interest. Let  $i$  represent that datum's index. Let  $\ell$  represent that datum's percentile. Let  $n$  represent the sample size (number of measurements). In general,

$$\ell = \frac{i}{n}$$

(a) We are given  $x = 94.469$ . This means  $i = 3$ . We know  $n = 6$ . Determine the percentile  $\ell$ .

$$\ell = \frac{3}{6}$$

$$\ell = 0.5$$

So, the answer is 0.5, or 50%.

(b) We are given  $\ell = 1$ . We can use algebra to solve for  $i$ .

$$\ell = \frac{i}{n}$$

Multiply both sides by  $n$ .

$$n \cdot (\ell) = n \cdot \left( \frac{i}{n} \right)$$

Simplify both sides.

$$n\ell = i$$

To make me happy, switch the sides.

$$i = n\ell$$

Now, we can evaluate  $i$ .

$$i = (6)(1)$$

$$i = 6$$

Determine the  $x$  associated with  $i = 6$ .

$$x = 95.637$$

(c) The mean is  $\frac{567.869}{6} = 94.6448333$

(d) If  $n$  is odd, then median is  $x_{\frac{n+1}{2}}$ , the value of  $x$  when  $i = \frac{n+1}{2}$ . Otherwise median is mean of  $x_{\lfloor \frac{n+1}{2} \rfloor}$  and  $x_{\lceil \frac{n+1}{2} \rceil}$ . So, median = 94.5355.

**2. Solution**

Let  $x$  represent a datum of interest. Let  $i$  represent that datum's index. Let  $\ell$  represent that datum's percentile. Let  $n$  represent the sample size (number of measurements). In general,

$$\ell = \frac{i}{n}$$

(a) We are given  $x = 50.622$ . This means  $i = 5$ . We know  $n = 54$ . Determine the percentile  $\ell$ .

$$\ell = \frac{5}{54}$$

$$\ell = 0.0926$$

So, the answer is 0.0926, or 9.26%.

(b) We are given  $\ell = 0.944$ . We can use algebra to solve for  $i$ .

$$\ell = \frac{i}{n}$$

Multiply both sides by  $n$ .

$$n \cdot (\ell) = n \cdot \left( \frac{i}{n} \right)$$

Simplify both sides.

$$n\ell = i$$

To make me happy, switch the sides.

$$i = n\ell$$

Now, we can evaluate  $i$ .

$$i = (54)(0.944)$$

$$i = 51$$

Determine the  $x$  associated with  $i = 51$ .

$$x = 62.541$$

(c) The mean is  $\frac{2996.602}{54} = 55.493$

(d) If  $n$  is odd, then median is  $x_{\frac{n+1}{2}}$ , the value of  $x$  when  $i = \frac{n+1}{2}$ . Otherwise median is mean of  $x_{\lfloor \frac{n+1}{2} \rfloor}$  and  $x_{\lceil \frac{n+1}{2} \rceil}$ . So, median = 54.698.