

**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  $x = 11.409$ . This means  $i = 3$ . We know  $n = 7$ . Determine the percentile  $\ell$ .

$$\ell = \frac{3}{7}$$

$$\ell = 0.429$$

So, the answer is 0.429, or 42.9%.

(b) We are given  $\ell = 0.143$ . 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  $i$ .

$$i = (7)(0.143)$$

$$i = 1$$

Determine the  $x$  associated with  $i = 1$ .

$$x = 10.817$$

(c) The mean is  $\frac{84.292}{7} = 12.0417143$

(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 = 11.734.

**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  $x = 66.121$ . This means  $i = 34$ . We know  $n = 56$ . Determine the percentile  $\ell$ .

$$\ell = \frac{34}{56}$$

$$\ell = 0.607$$

So, the answer is 0.607, or 60.7%.

(b) We are given  $\ell = 0.964$ . 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  $i$ .

$$i = (56)(0.964)$$

$$i = 54$$

Determine the  $x$  associated with  $i = 54$ .

$$x = 69.84$$

(c) The mean is  $\frac{3621.662}{56} = 64.673$

(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 = 65.344.