

**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  $x = 37.172$ . This means  $i = 4$ . We know  $n = 6$ . Determine the percentile  $\ell$ .

$$\ell = \frac{4}{6}$$

$$\ell = 0.667$$

So, the answer is 0.667, or 66.7%.

(b) We are given  $\ell = 0.5$ . 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  $i$ .

$$i = (6)(0.5)$$

$$i = 3$$

Determine the  $x$  associated with  $i = 3$ .

$$x = 35.362$$

(c) The mean is  $\frac{220.681}{6} = 36.7801667$

(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 = 36.267.

**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  $x = 54.782$ . This means  $i = 27$ . We know  $n = 42$ . Determine the percentile  $\ell$ .

$$\ell = \frac{27}{42}$$

$$\ell = 0.643$$

So, the answer is 0.643, or 64.3%.

(b) We are given  $\ell = 0.286$ . 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  $i$ .

$$i = (42)(0.286)$$

$$i = 12$$

Determine the  $x$  associated with  $i = 12$ .

$$x = 37.538$$

(c) The mean is  $\frac{2208.248}{42} = 52.577$

(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 = 46.753.