

1. Solution

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

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

(a) We are given $x = 11.229$. This means $i = 2$. We know $n = 7$. Determine the percentile ℓ .

$$\ell = \frac{2}{7}$$

$$\ell = 0.286$$

So, the answer is 0.286, or 28.6%.

(b) We are given $\ell = 0.714$. 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 .

$$i = (7)(0.714)$$

$$i = 5$$

Determine the x associated with $i = 5$.

$$x = 14.252$$

(c) The mean is $\frac{88.565}{7} = 12.6521429$

(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 = 11.452.

2. Solution

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

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

(a) We are given $x = 149.1$. This means $i = 7$. We know $n = 16$. Determine the percentile ℓ .

$$\ell = \frac{7}{16}$$

$$\ell = 0.438$$

So, the answer is 0.438, or 43.8%.

(b) We are given $\ell = 0.812$. 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 .

$$i = (16)(0.812)$$

$$i = 13$$

Determine the x associated with $i = 13$.

$$x = 184.652$$

(c) The mean is $\frac{2538.854}{16} = 158.68$

(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 = 159.72.