

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 $x = 91.02$. This means $i = 2$. We know $n = 6$. Determine the percentile ℓ .

$$\ell = \frac{2}{6}$$

$$\ell = 0.333$$

So, the percentile rank is $\boxed{0.333}$, or 33.3th percentile.

(b) We are given $\ell = 0.833$. 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 .

$$i = (6)(0.833)$$

$$i = 5$$

Determine the x associated with $i = 5$.

$$x = \boxed{111.046}$$

(c) The mean: $\bar{x} = \frac{605.096}{6} = \boxed{100.85}$

(d) If n is odd, then median is $x_{i=\frac{n+1}{2}}$, the value of x when $i = \frac{n+1}{2}$. Otherwise, if n is even, the median is mean of $x_{i=\frac{n}{2}}$ and $x_{i=\frac{n}{2}+1}$. In this case, $n = 6$ and so n is even.

$$\text{median} = \frac{x_3 + x_4}{2} = \frac{95.376 + 101.027}{2}$$

So, median = $\boxed{98.2015}$.

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 $x = 34.758$. This means $i = 7$. We know $n = 12$. Determine the percentile ℓ .

$$\ell = \frac{7}{12}$$

$$\ell = 0.583$$

So, the percentile rank is 0.583, or 58.3th percentile.

(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 .

$$i = (12)(1)$$

$$i = 12$$

Determine the x associated with $i = 12$.

$$x = \text{45.719}$$

(c) The mean: $\bar{x} = \frac{412.587}{12} = \text{34.382}$

(d) If n is odd, then median is $x_{i=\frac{n+1}{2}}$, the value of x when $i = \frac{n+1}{2}$. Otherwise, if n is even, the median is mean of $x_{i=\frac{n}{2}}$ and $x_{i=\frac{n}{2}+1}$. In this case, $n = 12$ and so n is even.

$$\text{median} = \frac{x_6 + x_7}{2} = \frac{33.891 + 34.758}{2}$$

So, median = 34.3245.