

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 $x = 177.575$. This means $i = 6$. We know $n = 6$. Determine the percentile ℓ .

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

$$\ell = 1$$

So, the percentile rank is 1, or 100th percentile.

(b) We are given $\ell = 0.667$. 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 .

$$i = (6)(0.667)$$

$$i = 4$$

Determine the x associated with $i = 4$.

$$x = \text{164.26}$$

(c) The mean: $\bar{x} = \frac{918.678}{6} = \text{153.11}$

(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.

$$\text{median} = \frac{x_3 + x_4}{2} = \frac{163.935 + 164.26}{2}$$

So, median = 164.0975.

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 $x = 72.729$. This means $i = 5$. We know $n = 28$. Determine the percentile ℓ .

$$\ell = \frac{5}{28}$$

$$\ell = 0.179$$

So, the percentile rank is $\boxed{0.179}$, or 17.9th percentile.

(b) We are given $\ell = 0.536$. 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 .

$$i = (28)(0.536)$$

$$i = 15$$

Determine the x associated with $i = 15$.

$$x = \boxed{73.817}$$

(c) The mean: $\bar{x} = \frac{2062.044}{28} = \boxed{73.644}$

(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, $n = 28$ and so n is even.

$$\text{median} = \frac{x_{14} + x_{15}}{2} = \frac{73.719 + 73.817}{2}$$

So, median = $\boxed{73.768}$.