

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 $x = 60.391$. This means $i = 6$. We know $n = 11$. Determine the percentile ℓ .

$$\ell = \frac{6}{11}$$

$$\ell = 0.545$$

So, the percentile rank is $\boxed{0.545}$, or 54.5th 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 .

$$i = (11)(1)$$

$$i = 11$$

Determine the x associated with $i = 11$.

$$x = \boxed{67.842}$$

(c) The mean: $\bar{x} = \frac{659.137}{11} = \boxed{59.922}$

(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, $n = 11$ and so n is odd.

$$\text{median} = x_{(11+1)/2} = x_6$$

So, median = $\boxed{60.391}$.

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 $x = 60.979$. This means $i = 5$. We know $n = 60$. Determine the percentile ℓ .

$$\ell = \frac{5}{60}$$

$$\ell = 0.0833$$

So, the percentile rank is 0.0833, or 8.33th percentile.

(b) We are given $\ell = 0.1$. 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 .

$$i = (60)(0.1)$$

$$i = 6$$

Determine the x associated with $i = 6$.

$$x = \text{61.221}$$

(c) The mean: $\bar{x} = \frac{3728.545}{60} = \text{62.142}$

(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, $n = 60$ and so n is even.

$$\text{median} = \frac{x_{30} + x_{31}}{2} = \frac{62.294 + 62.336}{2}$$

So, median = 62.315.