

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 $x = 63.373$. This means $i = 1$. We know $n = 8$. Determine the percentile ℓ .

$$\ell = \frac{1}{8}$$

$$\ell = 0.125$$

So, the percentile rank is $\boxed{0.125}$, or 12.5th percentile.

(b) We are given $\ell = 0.625$. 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 .

$$i = (8)(0.625)$$

$$i = 5$$

Determine the x associated with $i = 5$.

$$x = \boxed{67.819}$$

(c) The mean: $\bar{x} = \frac{535.578}{8} = \boxed{66.947}$

(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, $n = 8$ and so n is even.

$$\text{median} = \frac{x_4 + x_5}{2} = \frac{67.427 + 67.819}{2}$$

So, median = $\boxed{67.623}$.

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 $x = 35.271$. This means $i = 14$. We know $n = 32$. Determine the percentile ℓ .

$$\ell = \frac{14}{32}$$

$$\ell = 0.438$$

So, the percentile rank is $\boxed{0.438}$, or 43.8th percentile.

(b) We are given $\ell = 0.188$. 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 .

$$i = (32)(0.188)$$

$$i = 6$$

Determine the x associated with $i = 6$.

$$x = \boxed{32.52}$$

(c) The mean: $\bar{x} = \frac{1214.78}{32} = \boxed{37.962}$

(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, $n = 32$ and so n is even.

$$\text{median} = \frac{x_{16} + x_{17}}{2} = \frac{36.869 + 37.554}{2}$$

So, median = $\boxed{37.2115}$.