

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 $x = 70.557$. This means $i = 3$. We know $n = 9$. Determine the percentile ℓ .

$$\ell = \frac{3}{9}$$

$$\ell = 0.333$$

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

(b) We are given $\ell = 0.778$. 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 .

$$i = (9)(0.778)$$

$$i = 7$$

Determine the x associated with $i = 7$.

$$x = \boxed{72.011}$$

(c) The mean: $\bar{x} = \frac{637.912}{9} = \boxed{70.879}$

(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, $n = 9$ and so n is odd.

$$\text{median} = x_{(9+1)/2} = x_5$$

So, median = $\boxed{71.175}$.

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 $x = 55.032$. This means $i = 7$. We know $n = 63$. Determine the percentile ℓ .

$$\ell = \frac{7}{63}$$

$$\ell = 0.111$$

So, the percentile rank is $\boxed{0.111}$, or 11.1th percentile.

(b) We are given $\ell = 0.556$. 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 .

$$i = (63)(0.556)$$

$$i = 35$$

Determine the x associated with $i = 35$.

$$x = \boxed{58.408}$$

(c) The mean: $\bar{x} = \frac{3622.195}{63} = \boxed{57.495}$

(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, $n = 63$ and so n is odd.

$$\text{median} = x_{(63+1)/2} = x_{32}$$

So, median = $\boxed{58.24}$.