

Answer on Question #55116 – Math – Statistics and Probability

2.2 A countrywide estate agency specializes in selling commercial ventures. Their records show that the mean selling time is less than 90 days. Because of recent economic conditions, they believe that the mean selling time is now greater than 90 days. A countrywide survey of 100 businesses sold recently revealed that the mean selling time was 94 days, with a standard deviation of 22 days. At the 0.10 level of significance, has there been an increase in selling time?

Solution

$$H_0: \mu \leq 90$$

$$H_a: \mu > 90.$$

We don't know population standard deviation, so we use Student's t-distribution with $100-1=99$ degrees of freedom.

Test statistic is

$$T = \frac{94 - 90}{\frac{22}{\sqrt{100}}} = 1.82.$$

Critical value for 99 degrees of freedom and the 0.10 level of significance from t-table is

$$t^* = 1.29.$$

$T > t^*$, thus we reject the null hypothesis at the 0.10 level of significance. So there is an increase in selling time.

2.3 Given the following ordered arrangement of ungrouped data:

114 118 121 124 127 131 134 137

116 119 122 125 127 131 135 137

116 120 123 125 128 133 135 141

116 121 123 126 129 133 135 143

117 121 124 126 129 134 135 147

Arrange the data in a frequency distribution having the following columns:

Class boundaries, frequency, class mark.

Let the boundary values of the first class be: 110 - <115

Solution

Class boundaries	frequency	class mark
110 - <115	1	112.5
115 - <120	6	117.5
120 - <125	9	122.5
125 - <130	9	127.5
130 - <135	6	132.5
135 - <140	6	137.5
140 - <145	2	142.5
145 - <150	1	147.5

Frequency is the number of values which are located between class boundaries.

Class mark is the arithmetical mean of the class boundaries:

$$\text{Class mark} = \frac{\text{Leftlimit} + \text{Rightlimit}}{2}.$$