

Answer on Question #79670 – Math – Statistics and Probability

Question

A sample of 100 motorcar types has a mean of 20,000km and a standard deviation of 800km. as second sample of 150 tyres has a mean life of 22,000km and a standard deviation of 900km

1. is it true to say that the two samples were drawn from the population?
2. which is your rejection or acceptance as you conclude about the two population?

Solution

1. $F = \frac{s_1^2}{s_2^2} = 0.79.$

Since P-value for $F(99,149) = 0.79$ equals 0.90, we can assume equal variances.

Two sample t-test assuming equal variances.

$$H_0: \mu_1 = \mu_2$$

$$H_a: \mu_1 \neq \mu_2$$

Degrees of freedom: $df = n_1 + n_2 - 2 = 100 + 150 - 2 = 248.$

$$\text{Test statistic: } t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} = \frac{20000 - 22000}{\sqrt{\frac{99 \cdot 800^2 + 149 \cdot 900^2}{248} \left(\frac{1}{100} + \frac{1}{150}\right)}} = -17.98.$$

P-value (from the table): $p < 0.0001.$

Since the P-value is less than 0.05, the null hypothesis should be rejected.

Two samples are not drawn from the one population.

2. There is a sufficient evidence that the two population means are different.

Answer provided by <https://www.AssignmentExpert.com>