Assignment 11

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Outline

Question Statement

Question: From past records ,it is known that the life length of tyres of type A is a random variable X with standard deviation $\sigma = 5000$ miles and .We test 64 samples and find their average life length $\overline{X} = 25000$ miles.Find the 0.9 confidence interval of the mean.

Solution

Solution:

Approach

Two things affect the width of any confidence interval :

1. Variation in the population
2. Sample size

Central limit theorem underpins following:
Confidence interval=

$$\overline{X} \pm t \times \sigma/\sqrt{n} \tag{1}$$

where t =test statistic,n =sample size

t-value is calculated from sample data during Hypothesis tests and confidence level.From a standard chart ,t-value=1.6448.

$$\sigma = 5000 \tag{2}$$

$$\overline{X} = 25000 \tag{3}$$

$$n = 64 \tag{4}$$

$$confidence = 90\% \tag{5}$$

Plugging the values in the equation(1),we get:
Confidence interval=

$$25000 \pm 1028$$

$$\Rightarrow [23972, 26028]$$

Result

We can say with 90% confidence that most values for tyre life lies between $[23972, 26028]$ miles.