Test-2

Statistics

1. The height of adult males in a population follows a normal distribution with a mean of 170 cm and a standard deviation of 6 cm. What is the probability that a randomly selected male has a height between 164 cm and 176 cm?

2. In a class of students, the test scores are normally distributed with a mean of 75 and a standard deviation of 10. What is the probability that a student scores above 85?

3. In a study, a sample of 200 individuals was categorized by gender and preference for a new product. The observed frequencies are 50 men like the product, 70 men dislike it, 40 women like the product, and 40 women dislike it. Test whether the preference for the product is independent of gender using a chi-square test.

4. A researcher wants to compare the effectiveness of four different diets on weight loss. The weight loss (in kg) for individuals on each diet over 8 weeks is recorded. Perform an ANOVA test to determine if there is a significant difference in the mean weight loss among the four diets.

5. A telephone hotline receives an average of 3 calls per minute. What is the probability that in a given minute, the hotline will receive more than 5 calls?(Poisson distribution)

6. Two groups of students are taught using different teaching methods. Group A has 10 students with an average score of 85 and a standard deviation of 5. Group B has 12 students with an average score of 80 and a standard deviation of 6. Test at the 0.05 significance level if there is a significant difference between the average scores of the two groups.(t-test)

7. To determine the critical value for a significance level (α) of 0.05 for a two-tailed z-test, we need to understand the properties of the standard normal distribution (z-distribution). The significance level α represents the probability of rejecting the null hypothesis when it is actually true (Type I error). For a two-tailed test, we split the α into two equal parts, each tail containing $\alpha/2$.(Z-test)

8. Three different fertilizers are applied to three groups of plants. The yields (in kg) for each group are recorded as follows:

   Fertilizer A: 20, 22, 19

   Fertilizer B: 24, 21, 23

   Fertilizer C: 17, 18, 16
   Perform a one-way ANOVA to determine if there is a significant difference in the mean yields of the three fertilizers.