

Answer on question #41941, Math, Statistics and Probability

Two file servers are compared according to their response time for retrieving a small file. The mean response time of 50 such requests submitted to server 1 was measured to be 682ms with a known standard deviation of 25ms. A similar measurement in server 2 resulted in a sample mean of 676ms with a standard deviation of 28ms. Do these samples provide sufficient evidence to conclude that server 1 provides better response than server 2. Perform this test at 0.05 level of significance.

Solution

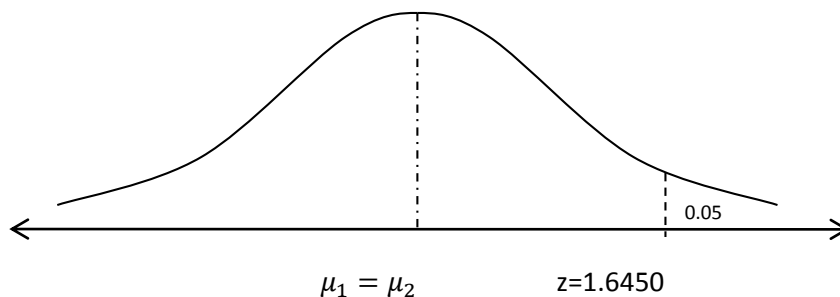
Step 1. State $H_0: \mu_1 \leq \mu_2$, $H_1: \mu_1 > \mu_2$.

Step 2. Type of test - right-tailed test.

Step 3. Level of significance: $\alpha = 0.05$.

Step 4. Critical value of the statistic: $z=1.6450$.

Step 5. Diagram



Step 6. Decision rule: Reject H_0 if z computed from evidence is more than 1.6450.

Step 7. Compute the statistic:

Evidence: $n_1 = n_2 = n = 50$, $\bar{x}_1 = 682$, $\bar{x}_2 = 676$, $\sigma_1 = 25$, $\sigma_2 = 28$.

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2 + \sigma_2^2}{n}}} = \frac{682 - 676}{\sqrt{\frac{25^2 + 28^2}{50}}} = 1.1303.$$

Step 8. Conclusion:

Do not Reject H_0 . These samples doesn't provide sufficient evidence to conclude that server 1 provides better response than server 2.