

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**

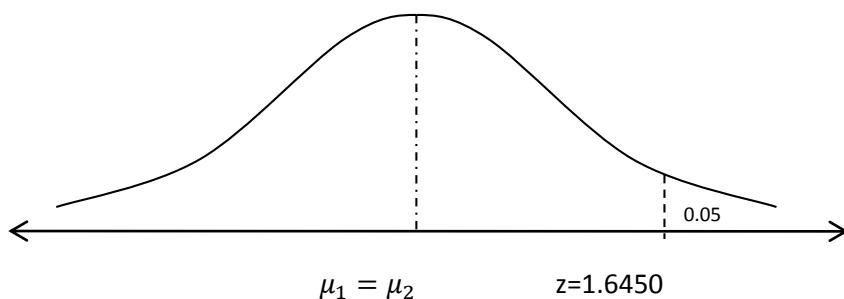
Step 1. State  $H_0: \mu_1 \leq \mu_2$ ,  $H_1: \mu_1 > \mu_2$ .

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.