

Name:

ID#:

Section#: 1 2

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Show your work in detail

It is believed that the SAT scores for students entering two state universities may have different standard deviations. Specifically, it is believed that the standard deviation at University A is greater than the standard deviation at University B. To test this using an alpha = 0.05 level, a sample of 14 student SAT scores from University A was selected and a sample of 8 SAT scores from University B was selected. The following sample results were observed:

| University A | University B |
|------------------|------------------|
| $\bar{x} = 1104$ | $\bar{x} = 1254$ |
| $s = 134$ | $s = 108$ |

Based on this information, do you agree with the belief?

The hypotheses are: $H_0: \sigma_A^2 \leq \sigma_B^2$ $H_A: \sigma_A^2 > \sigma_B^2$ (2)

The assumption is: The two populations are Normally distributed. (1)

The test statistic value:
 $F_0 = F_{cal} = \frac{s_A^2}{s_B^2} = \frac{(134)^2}{(108)^2} = \frac{17956}{11664} = 1.54$ (1)
 $df_1 = df_A = n_A - 1 = 14 - 1 = 13$
 $df_2 = df_B = n_B - 1 = 8 - 1 = 7$ (1)

The critical value: $F_{df_1, df_2, \alpha} = F_{13, 7, 0.05} = 3.55$ (1)

Decision Rule: If $F_0 > F_{\alpha} \Rightarrow$ Reject H_0 . (1)
 Since $F_0 = 1.54 < 3.55 = F_{\alpha} \Rightarrow$ Do NOT reject H_0 . (1)

Conclusion: No, I do NOT agree with the belief. (1)

With My Best Wishes