Stats Homework #7

Date 20

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1	2	3
2	5	3
1	3	4
3	6	5
3	4	5
2	5	3
1		5

P 11.5) $\alpha = 0.05$ Data ⇒

$n_1 = 6$ $n_2 = 5$ $n_3 = 6$

$\bar{x}_1 = 2.0$ $\bar{x}_2 = 4.6$ $\bar{x}_3 = 4.1667$

$\bar{\bar{x}} = 3.5294$

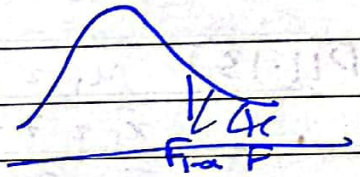
$SSC = 6(2-3.5294)^2 + 5(4.6-\bar{\bar{x}})^2 + 6(4.1667-\bar{\bar{x}})^2$

$= 22.202$

$SSE = 14.0333$ $SST = SSC + SSE = 36.2353$

$df_C = 2$ $df_E = 14$ $df_T = 16$

$F = 11.07$. $F_{1-\alpha,2,14} = 3.7389$.



Since $F > F_{1-\alpha,2,16}$, reject H_0!

P11.7) $\alpha = 0.01$

$n_1 = 4$ $n_2 = 4$ $n_3 = 4$ $n_4 = 4$

$\bar{x}_1 = 115.25$ $\bar{x}_2 = 125.25$ $\bar{x}_3 = 131.5$ $\bar{x}_4 = 122.5$

$\bar{\bar{x}} = 123.625$

$SSC = 544.25$ $SSE = 167.5$ $SST = 711.750$

$df_C = 3$ $df_E = 12$ $df_T = 15$

$F = 13$ $F_{1-\alpha,3,12} = 5.9525$

Since $F > F_{1-\alpha,3,12}$, reject H_0!

P11.9) 5 treatment levels 55 people in the study.

Source	SS	df	MS	F
Treatment	583.89	4	145.9725	7.5
Error	972.18	50	19.4436	
Total	1555.57	54		

$df_{Treat.} = 5-1 = 4$

$df_E = N-C = 55-5 = 50$

$df_{TOTAL} = N-1 = 55-1 = 54$

$MS_{Treatment} = SSTR/df_{TR} = 583.89/4 = 145.9725$

$MS_E = SSE/df_E = 972.18/50 = 19.4436$

$F = MS_{TR}/MS_E$

$F_{1-\alpha,4,50} =$

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P11.11) $\alpha = 0.01$ $n = 19$

$n_1 = 4$ $n_2 = 6$ $n_3 = 5$ $n_4 = 4$

$\bar{x}_1 = 4.03$ $\bar{x}_2 = 4.0017$ $\bar{x}_3 = 3.970$ $\bar{x}_4 = 4.0050$

$\bar{\bar{x}} = 4.0011$

$SSC = 0.0071$ $SSE = 0.0035$ $SST = 0.0106$

$df_C = 3$ $df_E = 15$ $df_T = 18$

$MSE = 0.00236$ $MSE = 0.00023$ $F = 10.1$

$F_{1-\alpha,3,15} = 5.4170$

We reject H_0!

P11.13) $n_1 = 5$ $n_2 = 7$ $n_3 = 6$

$\bar{x}_1 = 7.6$ $\bar{x}_2 = 8.8571$ $\bar{x}_3 = 5.8333$

$\bar{\bar{x}} = 7.5$ $SSC = 29.6095$ $SSE = 18.8905$

$SST = 48.5000$ $df_C = 2$ $df_E = 15$ $df_T = 17$

$MSC = 14.8048$ $MSE = 1.2594$ $F = 11.76$

Even $\alpha = 0.05$ $F_{1-\alpha,2,15} = 3.2979$

Since $F > F_{1-\alpha,2,15}$, we reject H_0!

There is not a significant difference in evaluations.

P11.15) levels $= df_C + 1 = 3 + 1 = 4$

Sample sizes: $n_1 = 18$ $n_2 = 15$ $n_3 = 21$ $n_4 = 11$

F-value $= 2.84$

p-value $= 0.045$ $\alpha = 0.05$

Means: $\bar{x}_1 = 230.11$ $\bar{x}_2 = 238.17$ $\bar{x}_3 = 235.18$ $\bar{x}_4 = 241.83$