13 pts.

ISE 2211 • Exam VII • 29 July 2021 NAME SOLUTION

A couple of exams ago, we explored the difference in lunch completion times between Joe Tritschler's ridiculous three-year-old twins. Turns out the four-year-old ain't much better in this respect. Use Analysis of Variance (ANOVA) to test the null hypothesis that their mean lunch completion times are equal at the $\alpha = 0.05$ level of significance. Fill in the ANOVA table.

Child	Lunch Completion Time (minutes)							Totals	Averages
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday		
Twin #1	37	42	29	24	65	82	26	305	43.57143
Twin #2	18	20	31	23	39	30	28	189	27
Older Bro	17	22	39	8	46	27	15	174	24.85714
								668	31.80952

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	f_0
Treatments	4304	2	734.5	3.072
Error	1469	18	239.1	-
Total	5773	20	-	-

$n = 7$, $a = 3$

$\therefore N = 21$

$\sum_{i=1}^{a}\sum_{j=1}^{n} y_{ij}^2 = 27022$ (+1)

$SS_T = 27022 - \frac{668^2}{21} = 5773$ (+1) d.o.f. $= 21-1 = 20$ (+1)

$SS_{Tr} = \frac{305^2 + 189^2 + 174^2}{7} - \frac{668^2}{21} = 1469$ (+1) d.o.f. $= 3-1 = 2$ (+1)

$SS_E = 5773 - 1469 = 4304$ (+1) d.o.f. $= 3(7-1) = 18$ (+1)

$MS_{Tr} = \frac{1469}{2} = 734.5$ (+1)

$MS_E = \frac{4304}{18} = 239.1$ (+1)

$f_0 = \frac{734.5}{239.1} = 3.072$ (+1)

$f_{critical} = f_{.05,2,18} = 3.55$ (+1)

$f_0 \not> f_{critical}$ (+1)

$\therefore$ fail to reject H_0 (+1)

lunch completion times are insignificantly different!!!