

STATS ASSIGNMENT: 4

Q3.

G ₁	G ₂	(G _i - M _{G1}) ²	(G _i - M _{G2}) ²
10	5	400	100
20	10	100	25
30	15	0	0
40	20	100	25
50	25	400	100
Total	150	1000	250
N	5	75	15
Mean	30	5	15
Grand Mean	22.50		

Within Group (Variance)

$$\text{Mean square (Within Group)} = \frac{1000 + 250}{(5-1) \times 3} = 104.17$$

Variance Between Groups

$$\text{sum of square (Mean)} = \frac{2}{(5-1)} (M_{G1} - M_{\text{Grand Mean}})^2$$

$$\text{Mean square (Between Group)} = \frac{(30-22.5)^2 + (5-22.5)^2}{(5-1)} = 112.50$$

$$F_{\text{stat}} = \frac{\text{Mean square (Between Group)}}{\text{Mean square (Within Group)}} = \frac{112.50 \times 5}{104.17} = 562.50$$

$$F_{\text{crit}}(df_1=1, df_2=8) = 5.318$$

Since $F_{\text{stat}} > F_{\text{crit}}$
REJECT H₀

STATS ASSIGNMENT - 4

Q1:

H_0 : Gender & education level are independent
 H_1 : " " " dependent

$$df = (n-1) \times (m-1) = (2-1) \times (4-1) = 1 \times 3 = 3$$

		Total		
		M	P	
		HS	B	
F	50	54	46	201
M	40	44	53	147
Total	100	98	99	345

$$(O-E)^2/E$$

	G1	G2	G3	$(G_1 - G_3)^2$	$(G_2 - G_3)^2$	$(G_3 - G_1)^2$
F	51	23	56	7.84	153.76	190.44
M	45	43	36	10.24	57.76	38.44
Total	33	23	41	231.04	153.76	17.64
	45	43	87	10.24	57.76	295.84
O	67	45	56	353.44	92.16	190.44
E	1.63					

Total = 241 177 349 1 612.80 515.20 732.80

n = 5 5 5

Mean = 48.2 35.4 69.8

Grand Mean = 51.13

Variance (Within Group)

Mean square = $(612.80 + 515.20 + 732.80) / (5-1) \times 3 = 155.07$

$$\chi^2_{\text{stat}} = 8.00$$

Variance (Between Group)

$\frac{1}{2} (\text{Grand Mean} - \text{Mean})^2 = \text{sum of square (between)}$

$$\frac{1}{2} (8.60 + 247.54 + 348.54) = 604.59$$

$$\chi^2_{\text{crit}}(\alpha=0.05, df=2) = 7.815$$

Since $\chi^2_{\text{stat}} > \chi^2_{\text{crit}}$, **[REJECT H0]**

Q2.

$H_0: \mu_{G1} = \mu_{G2} = \mu_{G3}$
 $H_1: \text{Performance of groups } (G_1, G_2, G_3) \text{ are different}$

$$F_{\text{stat}} = \frac{1511.47}{155.07} = 9.75 \quad F_{\text{crit}}(df_1=2, df_2=12) = 3.89$$

[REJECT H0]