HOME WORK - ANOVA

ANalysis Of VAriance - ANOVA

Problem 1.

Testing for Portfolio (Factor A)

$$H_o : \alpha_1 = \alpha_2 = \alpha_3 = 0 \qquad vs \qquad H_1 : \text{Not all } \alpha's \text{ are } 0$$

Test Statistic $= F_A$ - Stat $= 2.072$ and p-value $= 0.207 > 0.05$
Hence do not reject H_o.

Conclusion: Data does not provide sufficient evidence to support the fact that portfolios are different at 5% level.

Problem 2

Testing for Brand (Factor A)

$$H_o : \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0 \qquad vs \qquad H_1 : \text{Not all } \alpha's \text{ are } 0$$

Test Statistic $= F_A$ - Stat $= 3.344$ and p-value $= 0.0398 > 0.025$
Hence do not reject H_0.

Conclusion: Data does not provide sufficient evidence to support the fact that Brands are different at 2.5% level.

Problem 3.

Testing for Main effect - Darkness (Factor A)

$H_o : \alpha_1 = \alpha_2 = \alpha_3 = 0 \qquad vs \qquad H_1 :$ Not all $\alpha' s$ are 0

Test Statistic $= F_A$ - Stat $= 6.047$ and p-value $= 0.0365 < 0.05$
Hence reject H_o.

Conclusion: Data provides sufficient evidence to support the fact that darkness impacts the time at 5% level.

Testing for Main effect - Style (Factor B)

$H_o : \beta_1 = \beta_2 = 0 \qquad vs \qquad H_1 :$ Not all $\beta' s$ are 0

Test Statistic $= F_B$ - Stat $= 2.25$ and p-value $= 0.1843 > 0.05$
Hence do not reject H_o.

Conclusion: Data does not provide sufficient evidence to support the fact that styles are different at 5% level.

Testing for Interaction

$$H_o : \gamma_{11} = \gamma_{12} = \gamma_{13} = \gamma_{21} = \gamma_{22} = \gamma_{23} = 0$$

$$vs$$

$$H_1 : \text{Not all } \gamma's \text{ are } 0$$

Test Statistic = F_{AB} - Stat = 0.891 and p-value = 0.4585 $>$ 0.05
Hence do not reject H_o.

Conclusion: Data does not provide sufficient evidence to support the fact that there exists any interaction at 5% level.

Problem: 4. Latin Square

Testing for - Peanuts

$$H_o : \tau_1 = \tau_2 = \tau_3 = \tau_4 = 0 \qquad vs \qquad H_1 : \text{Not all } \tau's \text{ are } 0$$

Test Statistic = F_A - Stat = 3.558 and p-value = 0.0877 $>$ 0.05
Hence do not reject H_o.

Conclusion: Data does not provide sufficient evidence to support the fact that peanuts are different at 5% level.