MAT5007 – Applied Statistical Methods

Embedded Lab – R Statistical Software

FALL SEMESTER – 20222023L25+L26 SLOT

E-RECORD

Experiment No.: 10

Submitted By

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> MCA-I Year SITE



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Note: The codes are done in "repl it" environment because I was facing errors in Rstudio due to my laptop data being corrupted. Thank You for the considerations.

1. A company appoints 4 salesman (A, B, C & D) and observes their sales in 3 seasons (Summer, Winter & Monsoon). The figures (Rs. in Lakhs) are given in the following table.

	Treatments							
Seasons	Α		В		С		D	
Summer		36		36		21		35
Winter		28		29		31		32
Monsoon		26		28		29		29

Write down the R programming code to perform an analysis of variance at 5% level of significance.

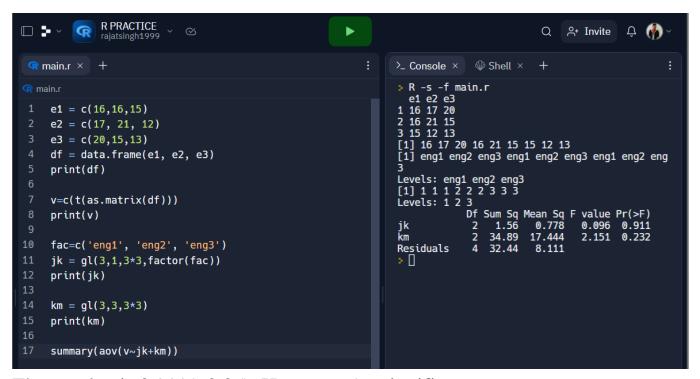
```
R PRACTICE
                                                                       Q &+ Invite
                                                       main.r × +
                                                       R -s -f main.r
main.r
                                                       w e r t
1 36 36 21 35
2 28 29 31 32
3 26 28 29 29
[1] 36 36 21 35 28 29 31 32 26 28 29
    w=c(36,28,26)
    e=c(36,29,28)
    r=c(21,31,29)
    t=c(35,32,29)
                                                        29
[1] A B C D A B C D A B C D
    df = data.frame(w,e,r,t)
                                                       Levels: A B C D
    print(df)
                                                                    Df Sum Sq Mean Sq F value
                                                                                        0.667
                                                                           42
                                                                                   14
    n=c(t(as.matrix(df)))
                                                         0.596
    print(n)
                                                       Residuals
                                                                          168
                                                                                   21
10
    fac = c('A', 'B', 'C', 'D')
                                                       > []
    jk = gl(4,1,4*3,factor(fac))
    print(jk)
    summary(aov(n~jk))
```

The p-value is 0.596(>0.05). So, at 5% significance level, we fail to reject the null hypothesis that the treatment effects are alike.

2. The following data resulted from an experiment to compare three burners (B1, B2 & B3). A Latin square design was used as the tests were made on 3 engines and were spread over 3 days.

	Engines					
Days	Engine 1	Engine 2	Engine 3			
Day 1	B1 – 16	B2 – 17	B3 – 20			
Day 2	B2 – 16	B3 – 21	B1 – 15			
Day 3	B3 – 15	B1 – 12	B2 – 13			

Write down the R programming code to test the hypothesis that there is no difference between (i). days, (ii). engines and (iii). burners at 5% level of significance.



The p-value is 0.911(>0.05). Hence, at 5% significance level, we fail to reject the null hypothesis that there is no significant difference between the engines.

The p-value is 0.232(0.05). Hence, at 5% significance level, we fail to reject the null hypothesis that there is no significant difference between the days