Statistical Inference: ANOVA Assignment

QUESTIONS

1. A new marketing campaign was tested in 12 randomly selected stores of a large retail group. Usual campaign was run in another 12 randomly selected stores during the same month. The outcome variable is “Sales Growth”. Is the new campaign more effective than usual campaign?

New Campaign			Usual Campaign	
Store No	Growth		Store No	Growth
1	11.5		13	9.4
2	12.3		14	10.3
3	14.5		15	13.2
4	11.9		16	14.1
5	12.6		17	10.1
6	13.4		18	11
7	10.5		19	9.4
8	9.5		20	9.6
9	14.1		21	9.8
10	13.8		22	10.3
11	12.2		23	11.1
12	11.8		24	9.2

2. In the above campaign testing, store numbers 1-4 and 13-16 are from ‘West’, 5-8 and 17-20 are from ‘South’ and 9-12 and 21-24 are from ‘East’. Test the effect of ‘Zone’ in this business experiment

SOLUTIONS

Arrange the data such that all numeric values are in a single column

Create variables Campaign and Zone in the next two columns

Import the data

```
camp_dat<-read.csv(file.choose(),header=T)
```

#1 Is the new campaign more effective? Running One way anova

```
anova<-aov(formula=Growth~Campaign,data=camp_dat)

summary(anova)
```

There is significant difference in the sales growth due to two campaigns (P value=0.0107 <0.05)

boxplot(Growth~Campaign,data=camp_dat)

#Boxplot suggests new campaign is more effective

#2 Adding zone and running two way anova

anova<-aov(formula=Growth~Campaign*Zone,data=camp_dat)

summary(anova)

#p-value <0.05 for campaign.There is significant difference between the two campaigns. However, p-value for region and interaction

#is > 0.05. Thus there is no significant interaction effect. Also no significant difference among regions.

#note: anova<-aov(formula=Growth~Campaign+Zone+Campaign*Region,data=camp_dat) can also be used.