Assignment 7

Perform one-way/ two-way analysis of variance (ANOVA) on data for evaluating hypothesis.

#One way anova

```
performance<-data.frame(school=rep(c('A','B','C','D'),each=5))
val=c(8,10,12,8,7,12,11,9,14,4,18,12,16,6,8,13,9,12,16,15)
oneway<-aov(val~school,data=performance)
summary(oneway)
```

OUTPUT

```
> #One way anova
> performance<-data.frame(school=rep(c('A','B','C','D'),each=5))
> val=c(8,10,12,8,7,12,11,9,14,4,18,12,16,6,8,13,9,12,16,15)
> oneway<-aov(val~school,data=performance)
> summary(oneway)
            Df Sum Sq Mean Sq F value Pr(>F)
school       3     50   16.67   1.282  0.314
Residuals   16    208   13.00
```

```
#Two way anova:
#1
sales<-c(36,28,26,36,29,28,21,31,29,35,32,29)
seasons<-gl(3,1,length(sales))
print(seasons)
salesman<-gl(4,3)
print(salesman)
twoway1<-aov(sales~seasons+salesman)
summary(twoway1)


#2
productivity<-c(44,46,34,43,38,38,40,36,38,42,47,52,44,46,49,36,43,32,33,39)
workers<-gl(5,1,length(productivity))
workers
machineType<-gl(4,5)
machineType
twoway1<-aov(productivity~workers+machineType)
summary(twoway1)
```

OUTPUT

```
> #Two way anova:
> #1
> sales<-c(36,28,26,36,29,28,21,31,29,35,32,29)
> seasons<-gl(3,1,length(sales))
> print(seasons)
 [1] 1 2 3 1 2 3 1 2 3 1 2 3
Levels: 1 2 3
> salesman<-gl(4,3)
> print(salesman)
 [1] 1 1 1 2 2 2 3 3 3 4 4 4
```

```
Levels: 1 2 3 4
> twoway1<-aov(sales~seasons+salesman)
> summary(twoway1)
            Df Sum Sq Mean Sq F value Pr(>F)
seasons      2     32   16.00   0.706  0.531
salesman     3     42   14.00   0.618  0.629
Residuals    6    136   22.67


> #2
> productivity<-c(44,46,34,43,38,38,40,36,38,42,47,52,44,46,49,36,43,32,33,39
> workers<-gl(5,1,length(productivity))
> workers
 [1] 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
Levels: 1 2 3 4 5
> machineType<-gl(4,5)
> machineType
 [1] 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 4 4 4 4 4
Levels: 1 2 3 4
> twoway1<-aov(productivity~workers+machineType)
> summary(twoway1)
            Df Sum Sq Mean Sq F value   Pr(>F)
workers      4  161.5   40.37   6.574  0.00485 **
machineType  3  338.8  112.93  18.388 8.78e-05 ***
Residuals   12   73.7    6.14
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```