CSE 635, Spring 2021, Homework 5
Sima Shafaei

Code:

```
veneer=read.table("VENEER.txt", header = TRUE)
head(veneer)
veneer$BRAND=as.factor(veneer$BRAND)
summary(veneer$BRAND)
length(veneer$BRAND)
boxplot(veneer$WEAR~veneer$BRAND)
anova=aov(veneer$WEAR~veneer$BRAND)
summary(anova)
attributes(anova)
anova$coefficients
```

Results:

```
> veneer=read.table("VENEER.txt", header = TRUE)
> head(veneer)
  OBS BRAND WEAR
1  1  ACME  2.3
2  2  ACME  2.1
3  3  ACME  2.4
4  4  ACME  2.5
5  5 CHAMP  2.2
6  6 CHAMP  2.3
> veneer$BRAND=as.factor(veneer$BRAND)
> summary(veneer$BRAND)
 ACME  AJAX CHAMP TUFFY  XTRA
    4     4     4     4     4
> length(veneer$BRAND)
[1] 20
> boxplot(veneer$WEAR~veneer$BRAND)
> anova=aov(veneer$WEAR~veneer$BRAND)
> summary(anova)
              Df Sum Sq Mean Sq F value  Pr(>F)
veneer$BRAND   4 0.6170 0.15425   7.404 0.00168 **
Residuals     15 0.3125 0.02083
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> attributes(anova)
$names
 [1] "coefficients"  "residuals"    "effects"      "rank"         "fitted.values"
"assign"        "qr"
 [8] "df.residual"   "contrasts"    "xlevels"      "call"         "terms"         "model"

$class
[1] "aov" "lm"
```
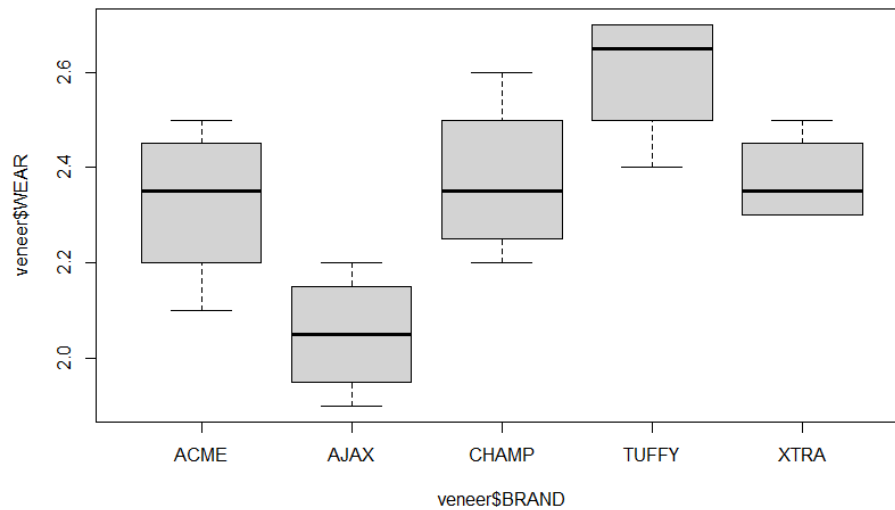
```
> anova$coefficients
    (Intercept)  veneer$BRANDAJAX veneer$BRANDCHAMP
veneer$BRANDTUFFY  veneer$BRANDXTRA
        2.325          -0.275           0.050          0.275          0.050
```


H0 : means for different brands are equal
Ha : there are at least two brands that have different means
p value is smaller than 0.05 ==> reject H0 with confidance level 95%
it is also clear from box plot