SA2_RATS

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library(car) ## R Markdown

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When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```r
# Assuming you have a dataframe named 'rats_data' with columns 'StimuliType' and 'ExplorationTime'
rats_data <- data.frame(
  StimuliType = c("Shape", "Shape", "Shape", "Shape", "Shape", "Shape", "Shape", "Shape",
                  "Pattern", "Pattern", "Pattern", "Pattern", "Pattern", "Pattern", "Pattern", "Pattern"
                  "Picture", "Picture", "Picture", "Picture", "Picture", "Picture", "Picture", "Picture"
                  "Shape", "Shape", "Shape", "Shape", "Pattern", "Pattern", "Pattern", "Pattern",
                  "Picture", "Picture", "Picture", "Picture"),
  ExplorationTime = c(2,0.75,1.25,1,1.5,1.25,1.75,0.5,2.5,3.25,1.85,3.05,2.5,3,4.1,3.75,4.25,4.1,4.25,4
)
#Descriptive Statistics
summary(rats_data)
```

```
##  StimuliType        ExplorationTime
##  Length:36          Min.   :0.500
##  Class :character   1st Qu.:1.688
##  Mode  :character   Median :3.025
##                     Mean   :2.697
##                     3rd Qu.:3.750
##                     Max.   :5.000
```

```r
#One Way ANOVA
anova_result <- aov(ExplorationTime ~ StimuliType, data = rats_data)
summary(anova_result)
```

```
##              Df Sum Sq Mean Sq F value   Pr(>F)
## StimuliType  2  44.53  22.263   62.09 6.53e-12 ***
## Residuals   33  11.83   0.359
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
#Descriptive Statistics for Each Group
by(rats_data$ExplorationTime, rats_data$StimuliType, summary)
```

```
## rats_data$StimuliType: Pattern
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
```

```
##    1.850   2.500   3.025   2.888   3.250   4.100
## --------------------------------------------------------------
## rats_data$StimuliType: Picture
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   3.050   3.612   4.175   3.954   4.287   5.000
## --------------------------------------------------------------
## rats_data$StimuliType: Shape
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.5000  0.9375  1.2500  1.2500  1.5625  2.0000
```

```r
#Levene's Test for Equality of Variances
levene_result <- car::leveneTest(ExplorationTime ~ StimuliType, data = rats_data)
```

```
## Warning in leveneTest.default(y = y, group = group, ...): group coerced to
## factor.
```

```r
print(levene_result)
```

```
## Levene's Test for Homogeneity of Variance (center = median)
##        Df F value Pr(>F)
## group   2  0.4313 0.6533
##        33
```

```r
#Post-Hoc Tests (Tukey's HSD) for Pairwise Comparisons
posthoc_result <- TukeyHSD(anova_result)
print(posthoc_result)
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = ExplorationTime ~ StimuliType, data = rats_data)
##
## $StimuliType
##                     diff        lwr        upr      p adj
## Picture-Pattern  1.066667  0.4668045  1.666529 0.0003414
## Shape-Pattern   -1.637500 -2.2373622 -1.037638 0.0000004
## Shape-Picture   -2.704167 -3.3040289 -2.104304 0.0000000
```