HW#2 Q2

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part g

```
banana_data <- data.frame(
  RipeningTime = c(
    87.33, 75.5, 99.67,   # Bag
    75.83, 34.83, 86.5,   # Wrap
    104.17, 71.17, 122.5, # Bag+Wrap
    51.67, 31.83, 46.17   # Neither
  ),
  Treatment = factor(rep(c("Bag", "Wrap", "BagWrap", "Neither"), each = 3)),
  Type = factor(rep(c("Organic", "Nonorganic", "Mini"), times = 4))
)

banana_data
```

```
##    RipeningTime Treatment       Type
## 1         87.33       Bag    Organic
## 2         75.50       Bag Nonorganic
## 3         99.67       Bag       Mini
## 4         75.83      Wrap    Organic
## 5         34.83      Wrap Nonorganic
## 6         86.50      Wrap       Mini
## 7        104.17   BagWrap    Organic
## 8         71.17   BagWrap Nonorganic
## 9        122.50   BagWrap       Mini
## 10        51.67   Neither    Organic
## 11        31.83   Neither Nonorganic
## 12        46.17   Neither       Mini
```

```
model_block <- aov(RipeningTime ~ Treatment + Type, data = banana_data)

summary(model_block)
```

```
##             Df Sum Sq Mean Sq F value  Pr(>F)
## Treatment    3   5511  1837.1   17.30 0.00234 **
## Type         2   2706  1353.2   12.74 0.00692 **
## Residuals    6    637   106.2
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

part k

```
TukeyHSD(model_block, "Treatment")
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = RipeningTime ~ Treatment + Type, data = banana_data)
##
## $Treatment
##                       diff        lwr       upr     p adj
## BagWrap-Bag      11.78000 -17.346160  40.90616 0.5423682
## Neither-Bag     -44.27667 -73.402827 -15.15051 0.0075854
## Wrap-Bag        -21.78000 -50.906160   7.34616 0.1411811
## Neither-BagWrap -56.05667 -85.182827 -26.93051 0.0022622
## Wrap-BagWrap    -33.56000 -62.686160  -4.43384 0.0276476
## Wrap-Neither     22.49667  -6.629494  51.62283 0.1273696
```

Based on the chart above, this is an interpretation of each comparison at 5%

Bag-Wrap: p = 0.14, not significant

Bag-Both: p = 0.54, not significant

Bag-Neither: p = 0.0076, significant

Wrap-Both: p = 0.0276, significant

Wrap-Neither: p = 0.13, not significant

Both-Neither: p = 0.0023, significant