

# Butter

RM | May 2021

*I'm the nice guy*

## Hey

- Knit this Rmd file to see if you can make a html or pdf. If you couldn't, just use RStudio Cloud or the Binder RStudio in the lab note homepage. Po loves RStudio. Everything you need is on the Cloud.
- Edit, add, delete the codes as you need. Delete and insert words/writings as you need.

# Codes in LabAssignment6.Rmd

## Part 1

Load data and peek.

```
#### Part I
ec <- read.csv("egyptianCotton.csv")
head(ec)
```

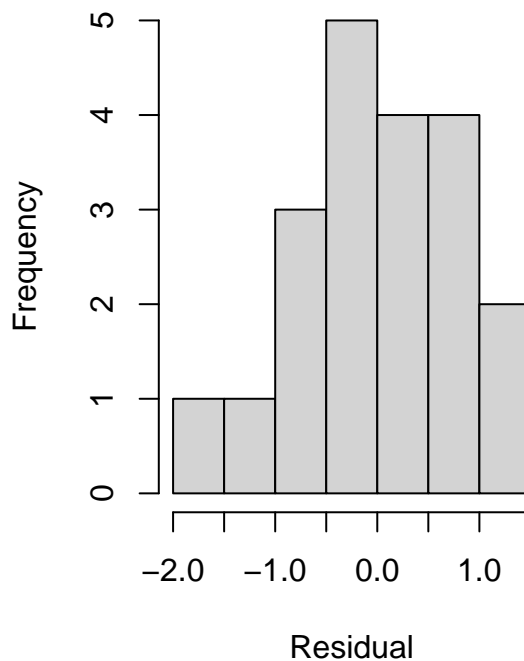
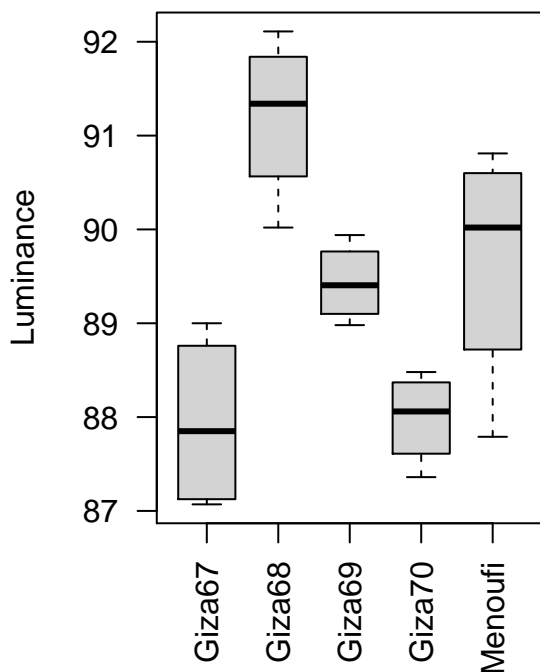
```
  Luminance Variety
1    89.94  Giza69
2    89.59  Giza69
3    89.22  Giza69
4    88.98  Giza69
5    89.00  Giza67
6    88.52  Giza67
```

Fit ANOVA model

```
fittedModel <- aov(Luminance ~ Variety,
                   data = ec
                   )
```

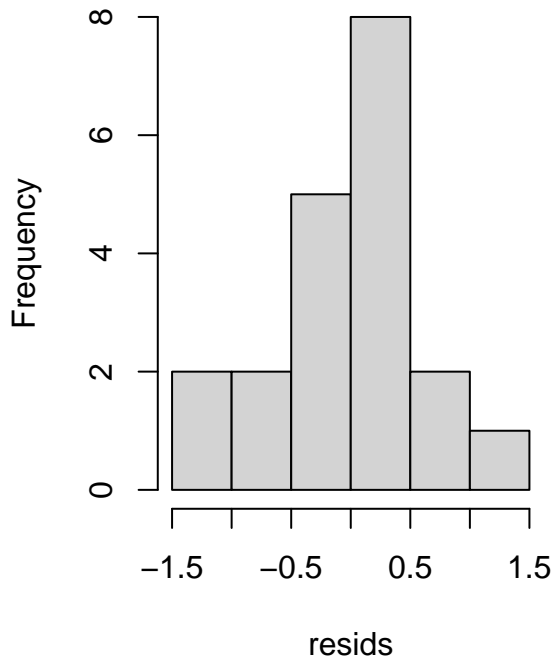
Model diagnostic

```
par(mfrow=c(1,2)) ## two side-by-side plots
boxplot(Luminance ~ Variety,
        data = ec,
        xlab="",
        las = 2 ## vertical labels
        )
hist(fittedModel$residuals,
     ylab="Frequency",
     xlab="Residual",
     main=""
     )
```



```
normalData <- rnorm(dim(ec)[1])
resids <- aov(normalData~Variety, data=ec)$residuals
hist(resids)
```

## Histogram of resids



Compute/show cool statistics things

```
anova(fittedModel)
```

Analysis of Variance Table

Response: Luminance

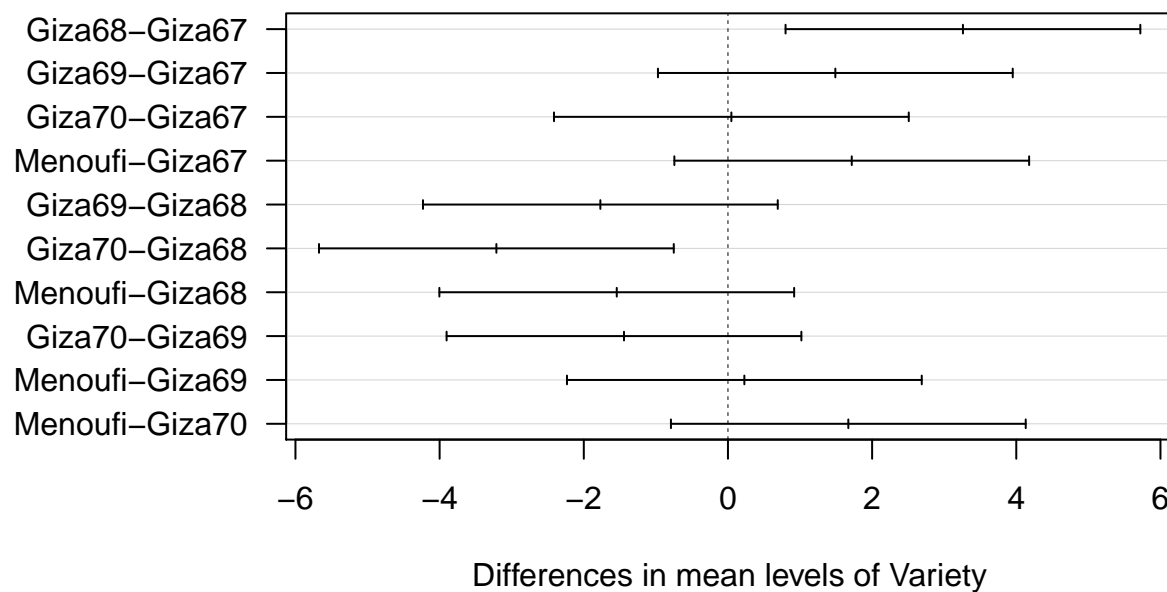
	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Variety	4	29.243	7.3107	9.3158	0.0005455 ***
Residuals	15	11.771	0.7848		

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

```
tuky <- TukeyHSD(fittedModel,
                  conf.level = 0.99
                )
par(mar=c(5,6,4,1)+1.2) ## so that labels don't get cut off
plot(tuky,
      las=1 ## horizontal labels
    )
```

### 99% family-wise confidence level



## Part II

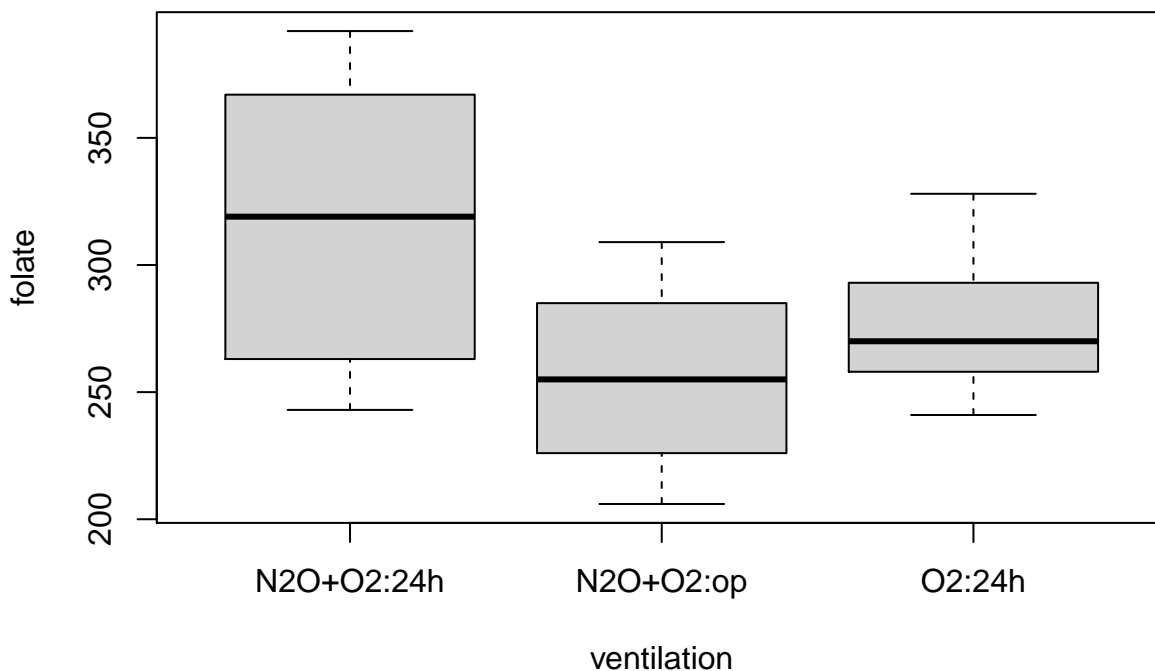
Data is [AnesthesiaVentilation.csv](#)

```
av <- read.csv("AnesthesiaVentilation.csv")  
# Or read.csv("http://www.stat.ucdavis.edu/~affarris/AnesthesiaVentilation.csv")  
head(av, 10)
```

```
  folate ventilation  
1    243 N2O+O2:24h  
2    251 N2O+O2:24h  
3    275 N2O+O2:24h  
4    291 N2O+O2:24h  
5    347 N2O+O2:24h  
6    354 N2O+O2:24h  
7    380 N2O+O2:24h  
8    392 N2O+O2:24h  
9    206 N2O+O2:op  
10   210 N2O+O2:op
```

```
boxplot(folate ~ ventilation,  
        data = av,  
        main = "Po is a nice guy."  
        )
```

**Po is a nice guy.**



```
fittedModel <- aov(folate ~ ventilation,  
                  data = av  
                  )  
anova(fittedModel)
```

Analysis of Variance Table

Response: folate

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
ventilation	2	15516	7757.9	3.7113	0.04359 *

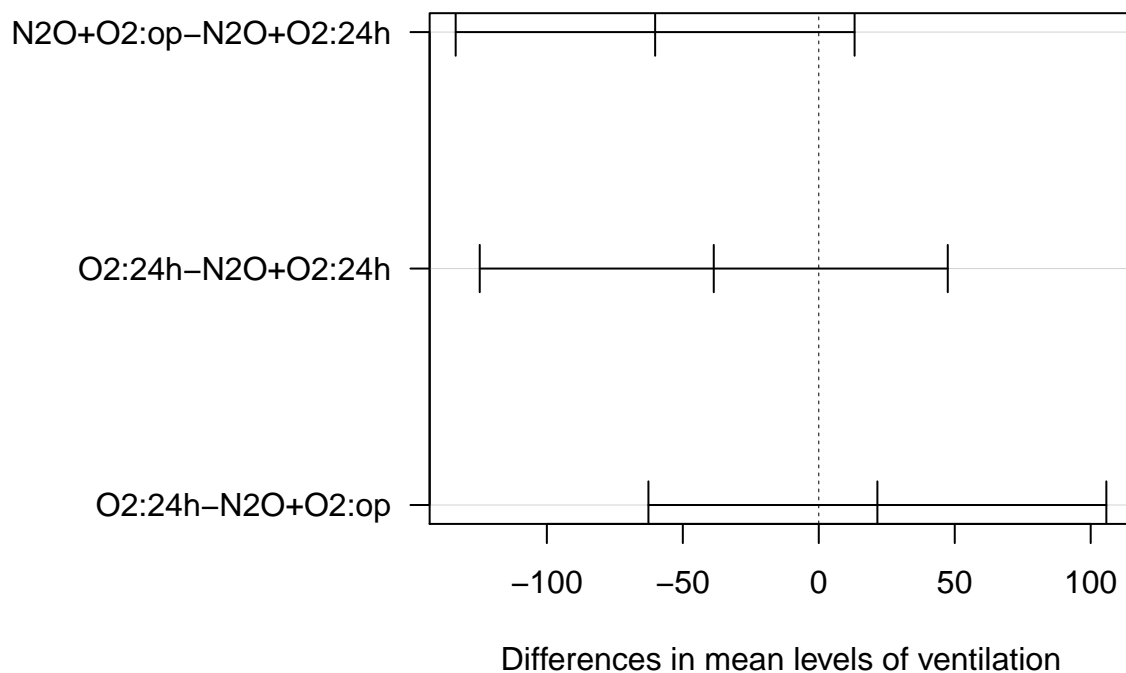
```
Residuals    19  39716  2090.3
```

```
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
tuky <- TukeyHSD(fittedModel,  
                 conf.level = 0.99  
                 )  
par(mar=c(5,12,4,2)+0.1)  
plot(tuky,  
     las=1 ## horizontal labels  
     )
```

### 99% family-wise confidence level



## Appendix: R Script

```
#### Part I
ec <- read.csv("egyptianCotton.csv")
head(ec)
fittedModel <- aov(Luminance ~ Variety,
                   data = ec
                   )
par(mfrow=c(1,2)) ## two side-by-side plots
boxplot(Luminance ~ Variety,
        data = ec,
        xlab="",
        las = 2 ## vertical labels
        )
hist(fittedModel$residuals,
     ylab="Frequency",
     xlab="Residual",
     main=""
     )
normalData <- rnorm(dim(ec)[1])
resids <- aov(normalData~Variety, data=ec)$residuals
hist(resids)
anova(fittedModel)
tuky <- TukeyHSD(fittedModel,
                 conf.level = 0.99
                 )
par(mar=c(5,6,4,1)+1.2) ## so that labels don't get cut off
plot(tuky,
     las=1 ## horizontal labels
     )
av <- read.csv("AnesthesiaVentilation.csv")
# Or read.csv("http://www.stat.ucdavis.edu/~affarris/AnesthesiaVentilation.csv")
head(av, 10)
boxplot(folate ~ ventilation,
        data = av,
        main = "Po is a nice guy."
        )
fittedModel <- aov(folate ~ ventilation,
                   data = av
                   )
anova(fittedModel)
tuky <- TukeyHSD(fittedModel,
                 conf.level = 0.99
                 )
par(mar=c(5,12,4,2)+0.1)
plot(tuky,
     las=1 ## horizontal labels
     )
```