

## One way ANOVAs in R

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Tue 8/4/2020 12:53 PM

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```
library("dplyr")  
library("rcompanion")  
library("car")  
library("ggplot2")  
library("IDPmisc")
```

```
# See if the number of people who cross differs by the way they cross
```

```
# Testing Assumptions
```

```
plotNormalHistogram(BorderCrossing$Value)
```

```
## That is not normally distributed at all - positively skewed
```

```
### Square root
```

```
BorderCrossing$ValueSQRT <- sqrt(BorderCrossing$Value)
```

```
plotNormalHistogram(BorderCrossing$ValueSQRT)
```

```
### Log
```

```
BorderCrossing$ValueLOG <- log(BorderCrossing$Value)
```

```
BorderCrossing2 <- NaRV.omit(BorderCrossing)
```

```
plotNormalHistogram(BorderCrossing2$ValueLOG)
```

```
#### Log looks great, go with that
```

```
## Bartlett's Test for homogeneity of variance
```

```
bartlett.test(ValueLOG ~ Measure, data=BorderCrossing2)
```

```
### If it's significant, that's bad, you have violated homogeneity (like we have here)
```

```
## Sample size - we have 355,000 something rows, so good there
```

```
# Run the test, use the Welch's test because we violated homogeneity of variance
```

```
ANOVA <- lm(ValueLOG ~ Measure, data=BorderCrossing2)  
Anova(ANOVA, Type="II", white.adjust=TRUE)
```

```
## It is significant, meaning that the number of people does vary based on their method of travel across the border
```

```
# Post hocs
```

```
pairwise.t.test(BorderCrossing$Value, BorderCrossing$Measure, p.adjust="bonferroni", pool.sd = FALSE)
```

```
## Every single group differs from every single other group. That is so not helpful!
```

```
# Look at the means
```

```
crossingMeans <- BorderCrossing %>% group_by(Measure) %>% summarize(Mean = mean(Value)) %>%  
arrange(desc(Mean))
```

```
# The fewest people come by trains, the most come by car. This needs more wrangling to get the best picture of  
all, though!
```

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