One-Way ANOVA in R

#One-Way ANOVA to compare Q7 responses to Academic Standing

```
> onewayANOVA1 <- aov(Q7.1N ~ RankedQ1N)
> summary(onewayANOVA1)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ1N     5   2.00  0.3998   0.401  0.846
Residuals    42  41.92  0.9980
8 observations deleted due to missingness
```

```
> onewayANOVA2 <- aov(Q7.2N ~ RankedQ1N)
> summary(onewayANOVA2)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ1N     5   1.21  0.2425            0.22  0.952
Residuals    42  46.27  1.1016
8 observations deleted due to missingness
```

```
> onewayANOVA3 <- aov(Q7.3N ~ RankedQ1N)
> summary(onewayANOVA3)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ1N     5   1.90  0.3803   0.365   0.87
Residuals    42  43.77  1.0420
8 observations deleted due to missingness
```

#There does not appear to be any statistically significant differences between years in college and how someone would respond to any of the Q7 statements.

#One-Way ANOVA to compare Q7 responses to Type of Major

```
> onewayANOVA4 <- aov(Q7.1N ~ RankedQ2NV1)
> summary(onewayANOVA4)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ2N     2   0.74  0.3701   0.506  0.607
Residuals    41  29.99  0.7314
12 observations deleted due to missingness

> onewayANOVA5 <- aov(Q7.2N ~ RankedQ2NV1)
> summary(onewayANOVA5)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ2N     2   2.19   1.097   1.419  0.254
Residuals    41  31.69   0.773
12 observations deleted due to missingness
```

#It appears that the type of major (i.e, STEM or not STEM) impacts the likelihood to agree or strongly agree that data analysis is important to their education and/or careers, but not to a statistically significant level beyond 70%.

```
> onewayANOVA6 <- aov(Q7.3N ~ RankedQ2NV1)
> summary(onewayANOVA6)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ2N     2   0.68  0.3385   0.427  0.655
Residuals    41  32.50  0.7928
12 observations deleted due to missingness
```

#Here's some additional ANOVA with the dataset that splits apart business majors from strict social science majors

```
> BizANOVA1 <- aov(Q7.1N ~ RankedQ2NV2)
> summary(BizANOVA1)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ2NV2   3  0.983  0.3277   0.441  0.725
Residuals    40 29.744  0.7436
12 observations deleted due to missingness

> BizANOVA2 <- aov(Q7.2N ~ RankedQ2NV2)
> summary(BizANOVA2)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ2NV2   3   2.52  0.8400   1.071  0.372
Residuals    40  31.37  0.7842
12 observations deleted due to missingness
> BizANOVA3 <- aov (Q7.3N ~ RankedQ2NV2)
```

```
> summary(BizANOVA3)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ2NV2  3   1.18  0.3935   0.492   0.69
Residuals   40  32.00  0.8000
12 observations deleted due to missingness
```

#Whether one keeps social sciences and businesses together or separate does not change the lack of statistical significance.

#One-Way ANOVA to compare Q7 responses to whether or not respondents had previously *heard* about FSU Libraries research data services

```
> AwarenessonewayANOVA1 <- aov(Q7.1N ~ RankedQ3N)
> summary(AwarenessonewayANOVA1)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ3N     1   4.72   4.720   5.539 0.0229 *
Residuals    46  39.20   0.852
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
8 observations deleted due to missingness
```

#With the above one-way ANOVA comparison, we can see that there is a statistically significant difference at the 95% confidence level between how people would respond to the statement *“The ability to critically think about and evaluate data (data literacy) is important to my academics and future career.”* and whether or not they had previously *heard of* a research data service.

```
> AwarenessonewayANOVA2 <- aov(Q7.2N ~ RankedQ3N)
> summary(AwarenessonewayANOVA2)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ3N     1   5.67   5.667   6.235 0.0162 *
Residuals    46  41.81   0.909
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
8 observations deleted due to missingness
```

#With the above one-way ANOVA comparison, we can see that there is a statistically significant difference at the 95% confidence level between how people would respond to the statement “*The ability to analyze data is important to my academics and future career*.” and whether or not they had previously *heard of* a research data service.

```
> AwarenessonewayANOVA3 <- aov(Q7.3N ~ RankedQ3N)
> summary(AwarenessonewayANOVA3)
             Df Sum Sq Mean Sq F value  Pr(>F)
RankedQ3N     1   6.23   6.231   7.268 0.00977 **
Residuals    46  39.44   0.857
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
8 observations deleted due to missingness
```

#With the above one-way ANOVA comparison, we can see that there is a statistically significa*nt* difference at the 99% confidence level between how people would respond to the statement

"*The ability to visualize data is important to my academics and future career*." and whether or not they had previously *heard of* a research data service.

#One-Way ANOVA to compare Q7 responses to people who used/didn't use a FSU Libraries research data service

```
> AwarenessonewayANOVA4 <-aov(Q7.1N ~ RankedQ4N)
> summary(AwarenessonewayANOVA4)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ4N    1   1.94  1.9377   2.123  0.152
Residuals   46  41.98  0.9126
8 observations deleted due to missingness

> AwarenessonewayANOVA5 <-aov(Q7.2N ~ RankedQ4N)
> summary(AwarenessonewayANOVA5)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ4N    1   3.54   3.537   3.703 0.0605 .
Residuals   46  43.94   0.955
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
8 observations deleted due to missingness
```

#With the above one-way ANOVA comparison, we can see that there is a statistically significant difference at the 90% confidence level between how people would respond to the statement "*The ability to analyze data is important to my academics and future career*." and whether or not they had previously *used* a data service.

```
> AwarenessonewayANOVA6 <-aov(Q7.3N ~ RankedQ4N)
> summary(AwarenessonewayANOVA6)
             Df Sum Sq Mean Sq F value Pr(>F)
RankedQ4N    1   0.59  0.5930   0.605  0.441
Residuals   46  45.07  0.9799
8 observations deleted due to missingness
>
```

#Outside of the specific statement "*The ability to analyze data is important to my academics and future career*.", there is not a statistically significant difference for *using* a data service in context of how someone would respond to the Question 7 statements.

#One-Way ANOVA to compare the use of a service to previously hearing about a service

#Note: This was added on 05/26/2022

```
> Q3Q4oneway <- aov(Q4N ~ Q3N)
> summary(Q3Q4oneway)
             Df Sum Sq Mean Sq F value Pr(>F)
Q3N           1  0.653  0.6532   4.309 0.0427 *
Residuals    54  8.186  0.1516
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

#This might seem obvious, but there is a statistically significant correlation between hearing about a data service and then later using it at the 95% confidence level.