**ANLY 511 – Ticket Master**

**One way anova:**

When testing an hypothesis with a categorical explanatory variable and a quantitative response variable, the tool normally used in statistics is **Analysis of Variances**, also called [ANOVA](https://en.wikipedia.org/wiki/Anova).

In this post I am performing an ANOVA test using the R programming language, to a dataset of ticketmaster minimum price across artists.

**The objective of the ANOVA test is to analyse if there is a (statistically) significant difference in minimum price of the concert tickets, between different artists.** In other words, I am interested to see whether minimum price of concert tickets are more likely to change with the artists’ performing.

The Hypothesis is:

Null Hypothesis There is no effect of the Artist on the Minimum Price

Alternative Hypothesis: There is an effect of the Artist on the Minimum Price

Here the artists are the explanatory variable and minimum price is the response variable.

We can see that, my F value is 17.48, and p-value is very low too. In other words, the variation of minimum price of tickets means among different artists is much larger than the variation of minimum price of tickets within each artist performing, and our p-value is less than 0.05, Hence **we reject the null hypothesis H0 and** can conclude that there is a significant relationship between artists and minimum price of concert tickets.

**Two way Anova:**

The two-way ANOVA test is used to simultaneously compare the effects of two grouping variables on a response variable at the same time.

**The objective of the ANOVA test is to analyse if there is a (statistically) significant difference in minimum price of the concert tickets, between different cities and different days (i.e. weekend or weekday).** In other words, I am interested to see whether minimum price of concert tickets are more likely to change with the cities and weekends.

The Hypothesis is:

Null Hypothesis: There is no effect of the City and Weekend on the Minimum Price

Alternative Hypothesis: There is an effect of the City and Weekend on the Minimum Price

Here the city and weekend are the explanatory variable and minimum price is the response variable.

We can see that, my F value is 3.92 for weekend and 3.25 for city, and p-value is very low too. In other words, the variation of minimum price of tickets means among different cities and different days is much larger than the variation of minimum price of tickets within each city and weekend or weekday performances. The p-value is less than 0.05, Hence **we reject the null hypothesis H0 and** can conclude that there is a significant relationship between cities and weekends to the minimum price of concert tickets.

We go ahead to check if you think these two variables will interact to create a synergistic effect.

Here, we can see that city, weekend and their interaction effect are all significant since their p-values are less than 0.05 and can conclude that there is a significant relationship between cities, weekends and their interaction effect to the minimum price of concert tickets.