RStudio Lab Week 5 – Non-Parametric's

This lab will help with your understanding of how the Wilcoxon Signed Rank Sum Test, the Mann-Whitney Wilcoxon Test, and the Kruskal Wallis Tests are performed in R. The data in this Lab consists of the average flight times of a plane flying over or under capacity, the average happiness gained from watching two different videos, and the results from an experiment on plants to compare yields (obtained under a control and two different treatment conditions.)

Instructions:

1) Make sure that you have downloaded the datasets: 'flight_times.xlsx' and 'happy_vids.xlsx'. Both the .xlsx files contain completely different data.
2) Copy the dataset into your student drive.
3) Make sure you have opened RStudio.
4) Set your working directory to your student drive by using Session – Set working directory – Choose directory, and navigate to your student drive (or wherever you have saved the dataset for this quiz).
5) Insert a new R Script, using File – New File – R Script OR by clicking the white page with the green + button and selecting R Script.
6) For this lab you need to read in an excel file, so we will first use the library() function and import the package readxl. This is performed by typing in library(readxl). You are now able to read in from excel files.
7) Import both the 'flight_times.xlsx' and 'happy_vids.xlsx' dataset into RStudio by clicking on it and selecting 'Import dataset' and then selecting 'Import' or by using the **read.xlsx()** function.
8) Use the **View()** function on both datasets to identify how they differ.
9) We will also be using a built in dataset in R called PlantGrowth. To access it you can use datasets::PlantGrowth and then run the line.
10) Use the the wilcox.test() and Kruskal.test() functions, to answer the following questions.

Question 1: An air traffic officer is interested in discovering if the same plane travelling under capacity will always have a quicker flight than when traveling over capacity. The officer collected the data found in flight_times.xlsx. Conduct an appropriate test at the 5% significance level to discover if the officer is correct in thinking that an under-capacity flight will be quicker than an over capacity one.

Question 2: Question 2: A Liverpool FC fan is trying to see if he is biased towards Darwin Núñez or if he truly is just extremely likable. Two groups of people were randomly selected with 18 members in each group. They were shown videos that were intended to make them smile. Group 1 was shown a video of kittens and puppies playing together, and group two were shown a clip of Darwin Núñez (the Number 9 for Liverpool FC) scoring goals and trying to converse with his teammates in English. After watching the respective videos, they were asked to choose a number to represent their increase in happiness.

1. No increase in happiness
2. Small increase in happiness
3. Moderate increase in happiness
4. Large increase in happiness
5. Very large increase in happiness

Apply to appropriate non-parametric test at the 5% significance level to confirm whether the Liverpool fan is delusional or if Darwin truly is just a cultivator of happiness.

Question 3: Results from an experiment to compare yields (as measured by dried weight of plants) obtained under a control and two different treatment conditions, where gathered. You are to test using the appropriate test at the 2.5% significance level if there is difference in weight between each treatment group.