**Analyzing Difference in Run Times in Women’s World Cup GS**

In World Cup Giant Slalom (GS), there are two runs. Only the thirty fastest racers from the first run take a second run. If a racer is disqualified (DSQ) or did not finish (DNF) their first run, they do not take a second run. The order for the first run is determined by taking all racers and ordering them by their World Cup points, from highest to lowest. From that, the top 30 racers are put into three groups. The best seven racers are randomly assigning them a bib 1-7. The next eight best competitors are randomly assigned a bib 8-15. The next best 15 racers are randomly assigned a bib 16-30. The remaining racers go in descending order of points. For the second run, competitors race in reverse order of their results on the first run, so the 30th fastest racer on the first run goes 1st on the second run and so on. This data set (<Tremblant1.csv>) includes data from only the top thirty finishers as any racers who placed higher than 30th do not take a second run. In this worksheet, you will be tasked with finding summary statistics and a confidence interval, perform a t-test, and interpret your findings.

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| **Variable** | **Description** |
| *Name* | Name of the racer. |
| *Nat* | Country the racer represents. |
| *Run1\_Order* | Start order for the first run. |
| *Run1\_Time* | Time for run 1 in seconds. |
| *Run1\_Rank* | Rankings of run 1. |
| *Run2\_Order* | Start order for the second run. |
| *Run2\_Time* | Time for run 2 in seconds. |
| *Run2\_Rank* | Rankings of run 2. |
| *Total\_Time* | Combined time of runs 1 and 2. |
| *Final\_Rank* | Final results. |
| *Rank\_Diff* | Difference between run 1 rank and final rank. |

1. Find the mean and standard deviation of the difference between *Run1\_Time* and *Run2\_Time*.
2. Find a 95% CI for difference in mean run times and give an interpretation of this interval. (If computing by hand, use n = 27 as three racers DNF Run 2).
3. Perform a test for difference in means. State hypotheses, test statistic, degrees of freedom, p-value, and an informative conclusion.
4. How do your findings in questions 3 and 4 relate?