**STAT3622 Quiz 1 (Open Book, But No Group Discussion)**

**Due on February 21 Midnight 12am**

1. Load three datasets in the files “colon.txt”, “ovarian.txt” and “gastadv.txt” in R. Each dataset has 5 variables as follows:

PFT: Progression-free survival time.

status\_PF: Censoring indicator for progression-free survival.

OT: Overall survival time.

status\_O: Censoring indicator for overall survival.

group: The treatment indicator, coded as 0 (control) and 1 (experimental treatment).

For **EACH** dataset, answer the following questions.

1. Plot the Kaplan-Meier curves for PFT by treatment group. Compare the survival distributions of two groups using the log-rank test.
2. Plot the Kaplan-Meier curves for OT by treatment group. Compare the survival distributions of two groups using the log-rank test.
3. For PFT, find the maximum of the smallest observed event time in each of the two groups and the minimum of the largest observed event time in each of the two groups, denoted as maxmin\_P and minmax\_P, respectively. Generate 20 time points in the interval [maxmin\_P, minmax\_P] that are equally spaced (i.e., an even partition of the interval). Using these partition points as the truncation time points, apply the restricted mean survival time (RMST) to compare the survival time distributions of two groups up to the 22 time points (including the boundary points maxmin\_P and minmax\_P). Compute the difference in RMST between the two groups and use it as the between-group contrast metric. Denote the sequence of the difference in RMST at the 22 time points by RMST\_P. Present values of RMST\_P.
4. For OT, repeat the procedure in (c). Denote the sequence of the difference in RMST at the 22 time points by RMST\_O. Present values of RMST\_O.
5. Show the scatter plot for RMST\_P and RMST\_O.
6. Calculate Spearman’s rank correlation and Kendall’s tau between RMST\_P and RMST\_O.
7. Summarize your conclusions, i.e., whether progression-free survival and overall survival are highly correlated.

Hint: Use relevant R packages for correlation and RMST calculation, e.g., survRM2.