BIOS 7323 - Exam 1 Review

Chapters 1 & 2

- For a given parametric distribution, calculate mean survival time, median survival time, p^{th} quantile, mean residual lifetime
- Find/convert between pdf, survival function, hazard function, cumulative hazard function given one of these quantities
- Recognize common distributions (Exponential, Weibull, Gamma)
- Recognize log-linear model form and multiplicative hazard form of regression models

Chapter 3

- Identify different types of censoring and truncation and construct likelihoods from these components
- Use a constructed likelihood to find the MLE

Chapter 4

- Calculate Kaplan-Meier estimate for survival (and extensions for $t > \max(T_i)$)
- Calculate Nelson-Aalen estimates for cumulative hazard
- Calculate Greenwood & Nelson-Aaelen variance estimates and be able to draw a rough sketch/plot of these estimates
- Construct pointwise confidence intervals for survival function
- Construct confidence bands for survival function given output
- Calculate point and interval estimates of mean survival and p^{th} quantile
- Interpret output from `survfit()`

Chapter 7

- Perform one sample hypothesis test with right censoring comparing to known distribution
- Perform K-sample hypothesis test comparing groups
- Understand different weight functions
- Perform hypothesis test for trend
- Perform stratified hypothesis test including matched pairs special case
- Know when to apply Renyi-type test
- Interpret output from `survdiff()`