STAT 499 Final 1pg Write-Up

For this DRP, I was paired up with Anna Neufeld. Throughout the quarter, we investigated the design and analysis of clinical trials, digging into the underlying statistics behind them. After building our knowledge base, we then dived into analyzing a real-world clinical trial, the Beta-Blocker Heart Attack Trial.

For the first five weeks, we alternated between reading the textbook and running simulations in R. In Week 1, I read a few introductory chapters of the textbook "Fundamentals of Clinical Trials" by Friedman et al. I studied the basics of clinical trials, including potential ethical concerns, study populations, sample sizes, and types of trial designs. Week 2 was when I ran my first simulation in R, investigating the impact of varying sample sizes and true difference in means on power. For Week 3, I returned to the textbook, studying potential adverse effects on patients, and how we monitor trials for potential early stopping. This was when I was introduced to the problem of multiple testing, and the Bonferroni correction, which I simulated in R in Week 4 (family wise error rate vs. power). Week 5 was when I read about group sequential methods, and learned the different methods we use to check whether we end a clinical trial early. In the same week, I simulated three sequential methods, Bonferroni, Pocock, and O'Brien Fleming, on the family wise error rate, and the power over each interim.

With the basic stats of clinical trials, I then set out in Week 6 to find an interesting clinical trial to analyze. I went through clinicaltrials.gov, and another textbook, and finally settled on the Beta-Blocker Heart Attack Trials. I took notes about the trial, and potential R simulations to explore in Week 7. In Week 8, I ran my final R simulation for my presentation, in which I checked how different sequential methods would've affected power and early stopping in the trial.

Weeks 9 and 10 were about finalizing the presentation. I learned the basics of LaTeX, working with Anna to refine my presentation and PPT slides for better communication. I then presented to the DRP group on Tuesday of Finals week.