STAT453/553 Final Project (2021 Spring)

Due Date: **May 7, 2021**

Submission: Upload your report to the Box folder that will be shared with you. **Name your file as follows: FirstnameLastnameSTAT553**

Objective: to compare and understand the operating characteristics of the CRM and BOIN using simulation

Setting: Consider a phase I trial that aims to find the MTD with the target toxicity rate of 0.2 or 0.3. The number of doses is 5. The maximum sample size is 30, and patients are treated in cohort size of 3.

For each of target toxicity rates (i.e., 0.2 and 0.3), construct 15 scenarios, resulting in a total of 30 scenarios. Under each scenario, run 1000 simulations to compare the performance of the CRM and BOIN designs.

Software:
BOIN https://www.trialdesign.org

CRM
https://www.trialdesign.org
or
https://biostatistics.mdanderson.org/softwaredownload/SingleSoftware.aspx?Software_Id=81

Report: Report should include

1. tables to display the scenarios
2. tables to show the percentage of selection and the number of patients assigned to each dose
3. figures to show the correct selection percentage of the MTD (selection accuracy)
4. figures to show the number of patients assigned to the MTD (allocation accuracy)
5. figures to show the average number of patients assigned to the doses above the MTD (safety for patients in current trial)
6. figures to show the average selection percentage of the doses above the MTD (safety for patients for future trial)
7. based on your simulation results, describe your findings. In particular, pros and cons of the CRM and BOIN (e.g., simplicity and performance).