CS 549: Performance Analysis of Computer Networks
Lab Assignment 3

Assigned: Apr 15, 2025 *Due date*: Apr 22, 2025

In this assignment, you will systematically conduct experiments to investigate the performance of your laptop's filesystem. Write a `C` program that reads a file using different methods and measure the read throughput (in bytes/sec). Below is an illustrative psuedo code.

(a) One byte at a time: `while (not eof) fgetc(inf)`

(b) One block at a time: `while (not eof) fread(buf, size, 1 ,inf)`
Try different values of `size` from $1 \cdots 100,000$.

Run the experiment for files of sizes 1 KB $\cdots$ 100 MB and record the read throughput. Present the following experiment details, analysis and results in your report.

1. Describe the statement of the problem.
2. Experiment design: List the factors and levels. List the set of experiments you ran, wherein each experiment is defined by the levels chosen for every factor. Justify your choice of experiments.
3. Present the data in the form of tables. Plot the read throughput and discuss your inferences.
4. Using range method to identify the factor that has the highest influence on the read throughput. Present your analysis in the form of tables. Discuss your findings.
5. Using ANOVA analyse the significance of the factor identified above to the variation in the read throughput.
6. *Optional*: Run R file readers in parallel and plot the performance as a function of R. Each reader reads a different file, all files being of the same size.