R Project for Summer School in Computational Modeling 2022

Your task is to write a program that replicates the experiment reported by Boneau (1960) in the enclosed article.

General hints:

Boneau (1960) varied n across two levels; 5 and 15. He also varied σ^2 (variance, not SD!) across two levels; 1 and 4. Because *n* and σ^2 were varied independently for each sample, this yields 9 design cells altogether.

Actually, there is a further wrinkle here…. there is one cell that's special and needs to be considered in two different ways.

Each cell, in turn, involves sampling of data from a rectangular (uniform), Gaussian (normal), or exponential distribution, all of mean 0 and variance determined by level of σ^2. So altogether, this yields 27 different experimental conditions. (Plus the wrinkle just mentioned, which will change that number).

For the project, you should replicate those 27+ cells for starters, and then focus on those that are most interesting (i.e. greatest effects of violation of assumptions) and explore those by accentuating the problems (e.g., by increasing variance or decreasing n or whatever).

Specific hints:

The project can be solved using R's built-in *t.test* function. However, it would be particularly meritorious if (time permitting) you also write your own function (e.g., *my.t.test*) that computes the t-statistics and other information and returns it in a same (or similar) structure as the built-in function.