# Simulation & Profiling

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This week covers how to simulate data in R, which serves as the basis for doing simulation studies. We also cover the profiler in R which lets you collect detailed information on how your R functions are running and to identify bottlenecks that can be addressed. The profiler is a key tool in helping you optimize your programs. Finally, we cover the str function, which I personally believe is the most useful function in R.

## Learning Objectives

By the end of this week you should be able to:

- Call the str function on an arbitrary R object
- Describe the difference between the "by.self" and "by.total" output produced by the R profiler
- Simulate a random normal variable with an arbitrary mean and standard deviation
- Simulate data from a normal linear model