Hypothetical Benchmark Program Run-Time Statistics

We will use the following set of statistics throughout the semester to compare the performance of different CPU pipelines under the same workload.

For any given pipeline or problem, some of these statistics *may be superfluous* (unnecessary or irrelevant) to that particular problem.

- \( N \) = total number of *useful* instructions (before any added NOPs)
- \( L = .20 \, N \) = number of LOAD instructions (as a fraction of \( N \))
- \( S = .10 \, N \) = number of STORE Instructions (as a fraction of \( N \))
- \( U = .06 \, N \) = number of Unconditional BRANCH instructions (as a fraction of \( N \))
- \( C = .15 \, N \) = number of Conditional BRANCH instructions (as a fraction of \( N \))
- \( B = U + C \) = total number of BRANCH instructions
- \( f_T = .76 \) = fraction of *Conditional* branches that are *Taken*

FYI, these numbers are derived from a simulator run with a real benchmark program, and are fairly typical for general purpose computer programs.