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 to that particular problem (i.e. unnecessary or irrelevant).

- \( N \) = total number of useful instructions (before any added NOPs)
- \( L = .16 \, N \) = number of LOAD instructions (as a fraction of \( N \))
- \( S = .08 \, N \) = number of STORE Instructions (as a fraction of \( N \))
- \( C = .20 \, N \) = number of Conditional BRANCH instructions (as a fraction of \( N \))
- \( U = .05 \, N \) = number of Unconditional BRANCH instructions (as a fraction of \( N \))
- \( B = U + C \) = total number of BRANCH instructions
- \( f_T = .75 \) = fraction of Conditional branches that are Taken

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