Advanced Rust 2026 - Extension Lab: Performance and Profiling

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Lab Goals

1. Build a reproducible benchmarking workflow.
2. Detect cache/contention bottlenecks.
3. Practice evidence-driven optimization.

Time Plan (90 min)

1. 20 min - benchmarking setup
2. 25 min - exercise 1 (algorithmic variant comparison)
3. 25 min - exercise 2 (contention measurement)
4. 20 min - exercise 3 (result interpretation)

Exercise 1: Baseline vs Improved Algorithm

Benchmark two implementations of the same task.

Report:

1. median time
2. variance
3. input-size scaling trend

Exercise 2: Contention Experiment

Measure throughput for shared counter:

1. global mutex
2. sharded counters + reduction
3. atomic relaxed counter

Discuss where each approach fails.

Exercise 3: Result Report

Prepare short report:

1. hypothesis
2. setup
3. results
4. recommendation
5. residual risks