

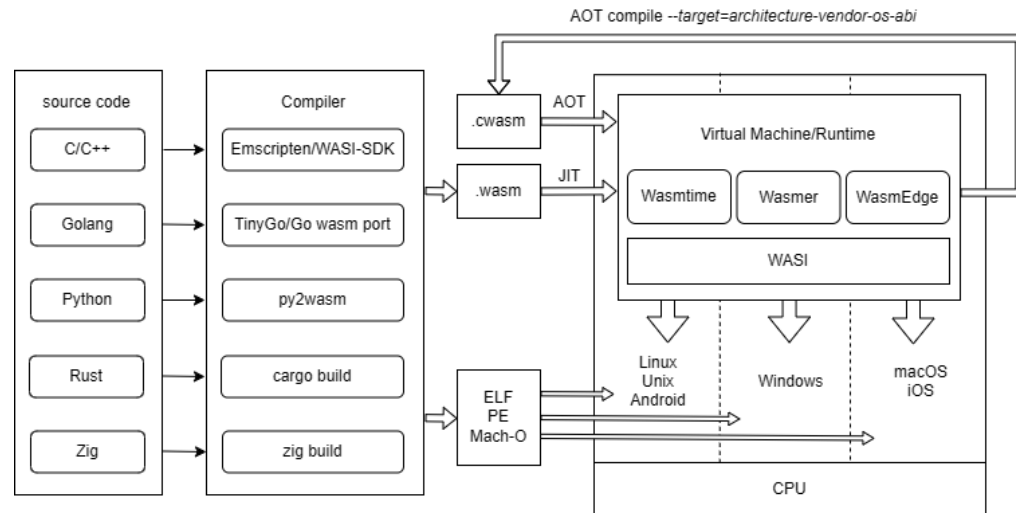
WABench: A Cross-Language Benchmark Suite for WebAssembly Performance Evaluation

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Problems & Ideas

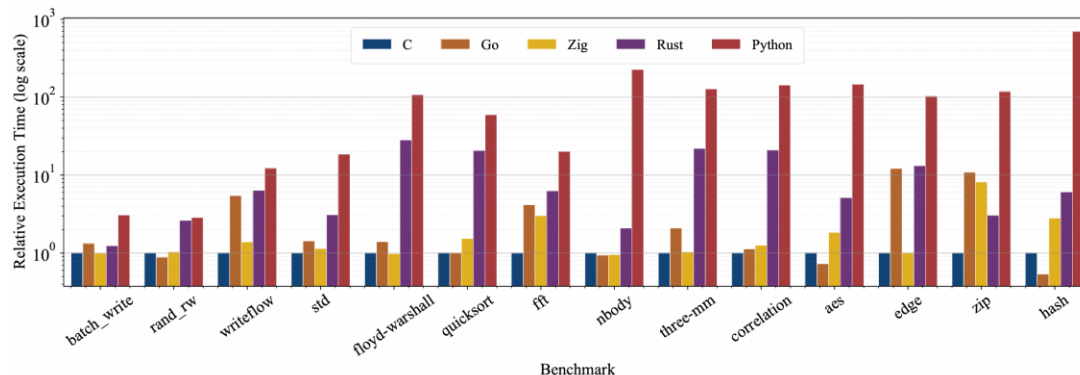
- Problems of conventional stereo matching approaches:
 - Existing studies rely on legacy CPU benchmarks not tailored for WebAssembly(Wasm) execution constraints.
 - Most evaluations focus on a single language or toolchain, lacking cross-language comparability.
- Ideas: A benchmarking suite that supports systematic study of compiler evolution, runtime optimization strategies, and language-specific performance behaviors, enabling comprehensive and comparable Wasm performance analysis.



WebAssembly Benchmark Execution Workflow in WABench

Main Contributions

- Contributions:
 - A cross-language and semantically unified benchmark suite that offers consistent implementations across C, Rust, Go, Zig, and Python, enabling fair and reproducible Wasm performance evaluation.
 - A standardized build-and-execution workflow that integrates compiler toolchains and mainstream Wasm runtimes, providing reliable measurements of compilation efficiency, bytecode characteristics, and runtime behavior.
 - A multi-dimensional performance analysis framework covering JIT execution, WASI I/O throughput, and compiler evolution, allowing systematic comparison across languages, toolchains, and runtime engines.



JIT compilation performance analysis. Logarithmic-scale execution time comparison across five programming languages