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(57) Abstract :

The present invention discloses a software framework (100) for optimizing compilation across multiple programming languages. The framework includes an orchestration layer (101) that coordinates compiler toolchains (102a–102d), a dependency analyzer (103) for eliminating redundant builds, and a cross-language optimization engine (104) for harmonized performance. A resource manager (105) adaptively allocates system resources, while a security validation module (106) ensures safe compilation. A diagnostic console (107) provides unified error visualization. Collectively, these modules accelerate builds, enhance productivity, and ensure reliable multi-language software development.

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