

Comparing a Tree-walk Interpreter with JIT compilation and embedding via Go-plugins

Evaluating the trade-offs of using the Go-plugin API for JIT compilation while comparing the approach with a Tree-walk interpreter

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DHBW

Interpreted Programming Language Performance

Common Interpreter design approaches

- AST walker (naive)
- Byte code compiler and virtual machine

Just In Time Compilation

- translating selected byte code or ast nodes to machine code
- execute machine code instead of interpreting chunk

With Just in Time Compilation

- math: 14.51x improvement (from 13.64s to 0.94s)
- string concat: 4.59x improvement (from 14.17s to 3.09s)
- real world: 1.43x improvement (from 8.04s to 5.62s)

Conclusion

- implemented JIT for subset of language
- measured performance improvements
- evaluated the usability of the plugin api

Gophers

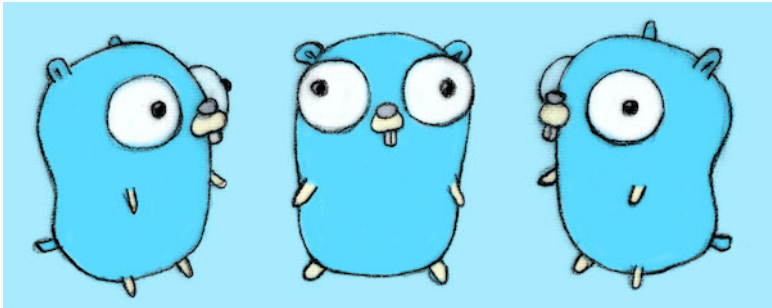


Abbildung 1: Quelle: <https://go.dev/blog/gopher>