for C++ Developers

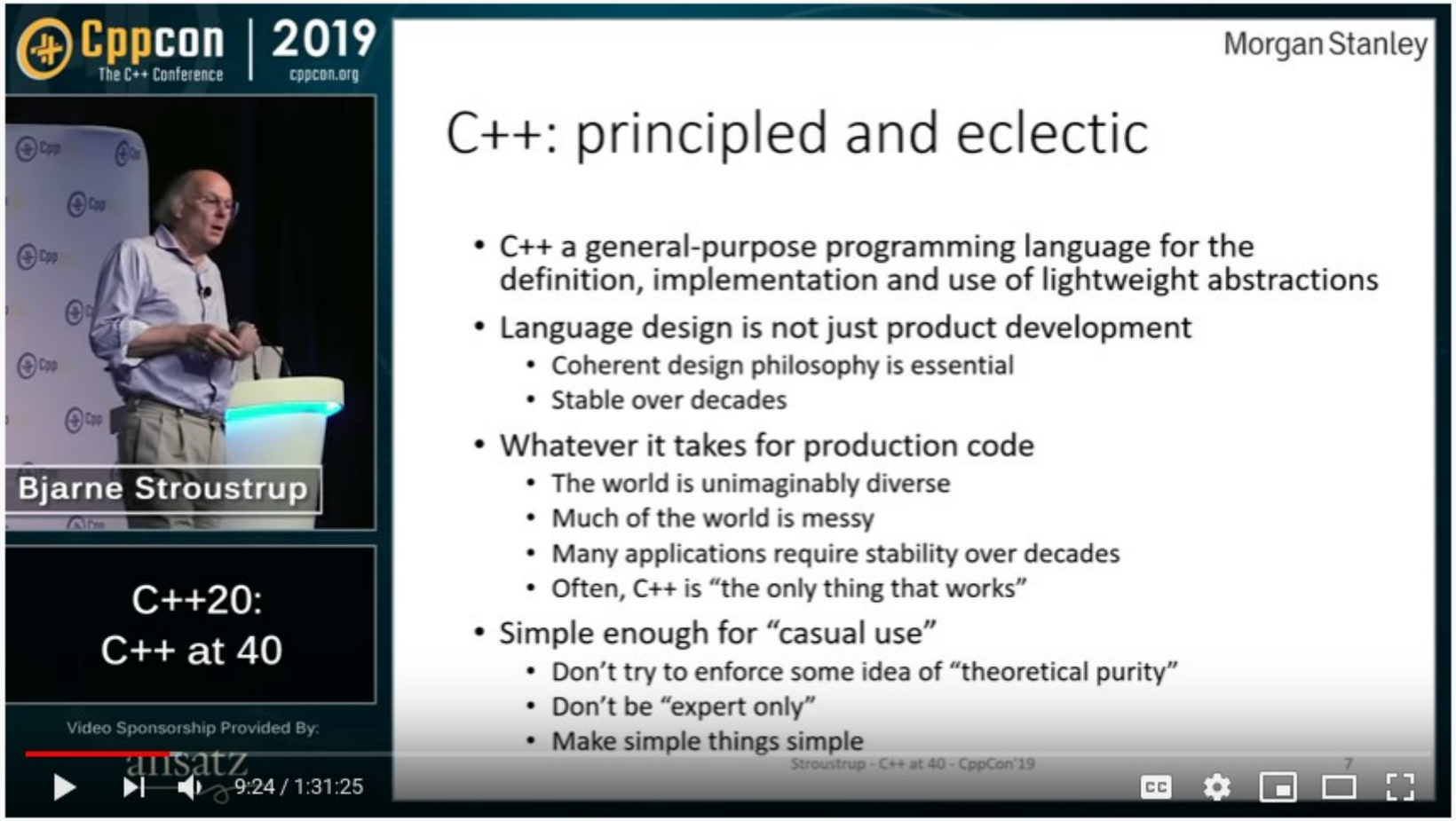
Bob McNaughton

9/25/19

Go, also known as Golang, is a statically typed, compiled programming language designed at Google by Robert Griesemer, Rob Pike, and Ken Thompson. Go is syntactically similar to C, but with memory safety, garbage collection, structural typing, and CSP-style concurrency.

Every introductory Go tutorial uses the same adjective to descibe it…

OPINIONATED!


Cppcon
The C++ Conference
2019
cppcon.org
Bjarne Stroustrup
C++20:
C++ at 40
Video Sponsorship Provided By:
ansatz
9:24 / 1:31:25
Morgan Stanley
C++: principled and eclectic
• C++ a general-purpose programming language for the definition, implementation and use of lightweight abstractions
• Language design is not just product development
  • Coherent design philosophy is essential
  • Stable over decades
• Whatever it takes for production code
  • The world is unimaginably diverse
  • Much of the world is messy
  • Many applications require stability over decades
  • Often, C++ is "the only thing that works"
• Simple enough for "casual use"
  • Don't try to enforce some idea of "theoretical purity"
  • Don't be "expert only"
  • Make simple things simple
Stroustrup - C++ at 40 - CppCon'19
7

From the golang.org FAQ:

> Meanwhile, we had become frustrated by the undue complexity required to use the languages we worked with to develop server software. Computers had become enormously quicker since languages such as C, C++ and Java were first developed but the act of programming had not itself advanced nearly as much. Also, it was clear that multiprocessors were becoming universal but most languages offered little help to program them efficiently and safely.

The key point here is our programmers are Googlers, they're not researchers. They're typically, fairly young, fresh out of school, probably learned Java, maybe learned C or C++, probably learned Python. They're not capable of understanding a brilliant language but we want to use them to build good software. So, the language that we give them has to be easy for them to understand and easy to adopt.

http://channel9.msdn.com/Events/Lang-NEXT/Lang-NEXT-2014/From-Parallel-to-Concurrent

The designers were primarily motivated by their shared dislike of C++.[26][27][28]

26. ^ Andrew Binstock (May 18, 2011). "Dr. Dobb's: Interview with Ken Thompson". Retrieved February 7, 2014.
27. ^ Pike, Rob (2012). "Less is exponentially more".
28. ^ Robert Griesemer (2015). "The Evolution of Go".

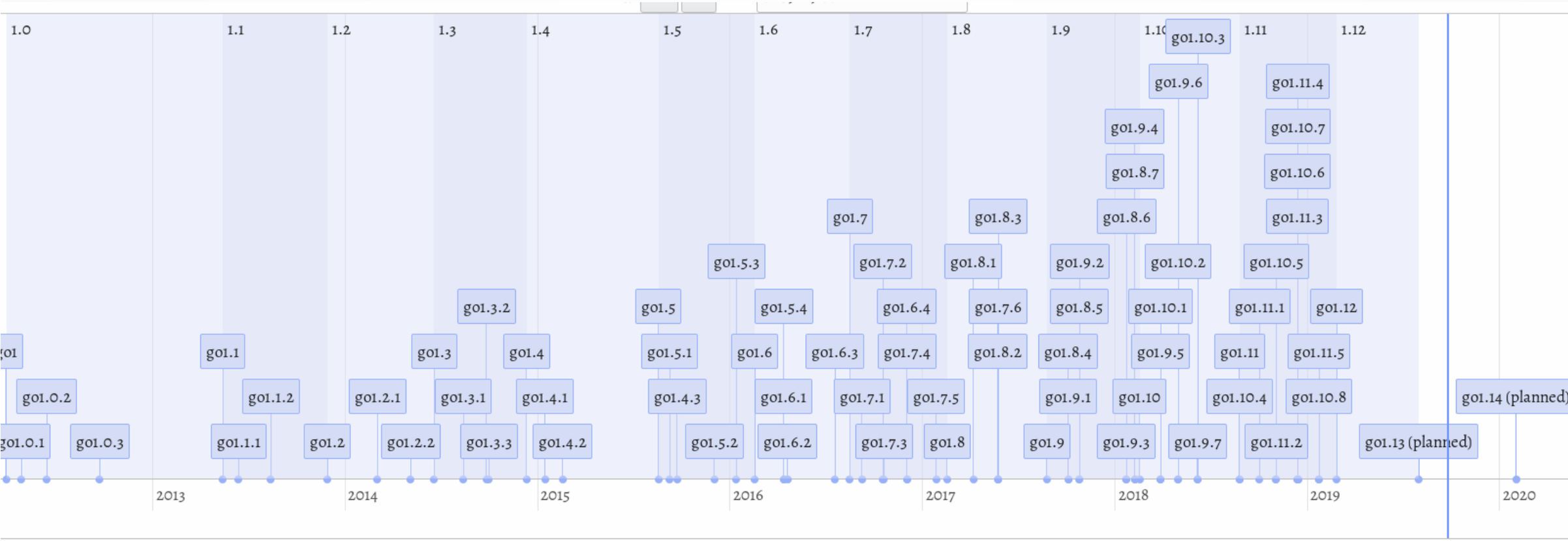
Keywords

The following keywords are reserved and may not be used as identifiers.

```
break        default      func         interface    select
case         defer        go           map          struct
chan         else         goto         package      switch
const        fallthrough  if           range        type
continue     for          import       return       var
```

Go's basic types are

```
bool

string

int  int8  int16  int32  int64
uint uint8 uint16 uint32 uint64 uintptr

byte // alias for uint8

rune // alias for int32
     // represents a Unicode code point

float32 float64

complex64 complex128
```


1.0
1.1
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go1.9.6
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go1.10.6
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go1.8.3
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go1.11.3
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go1.7.6
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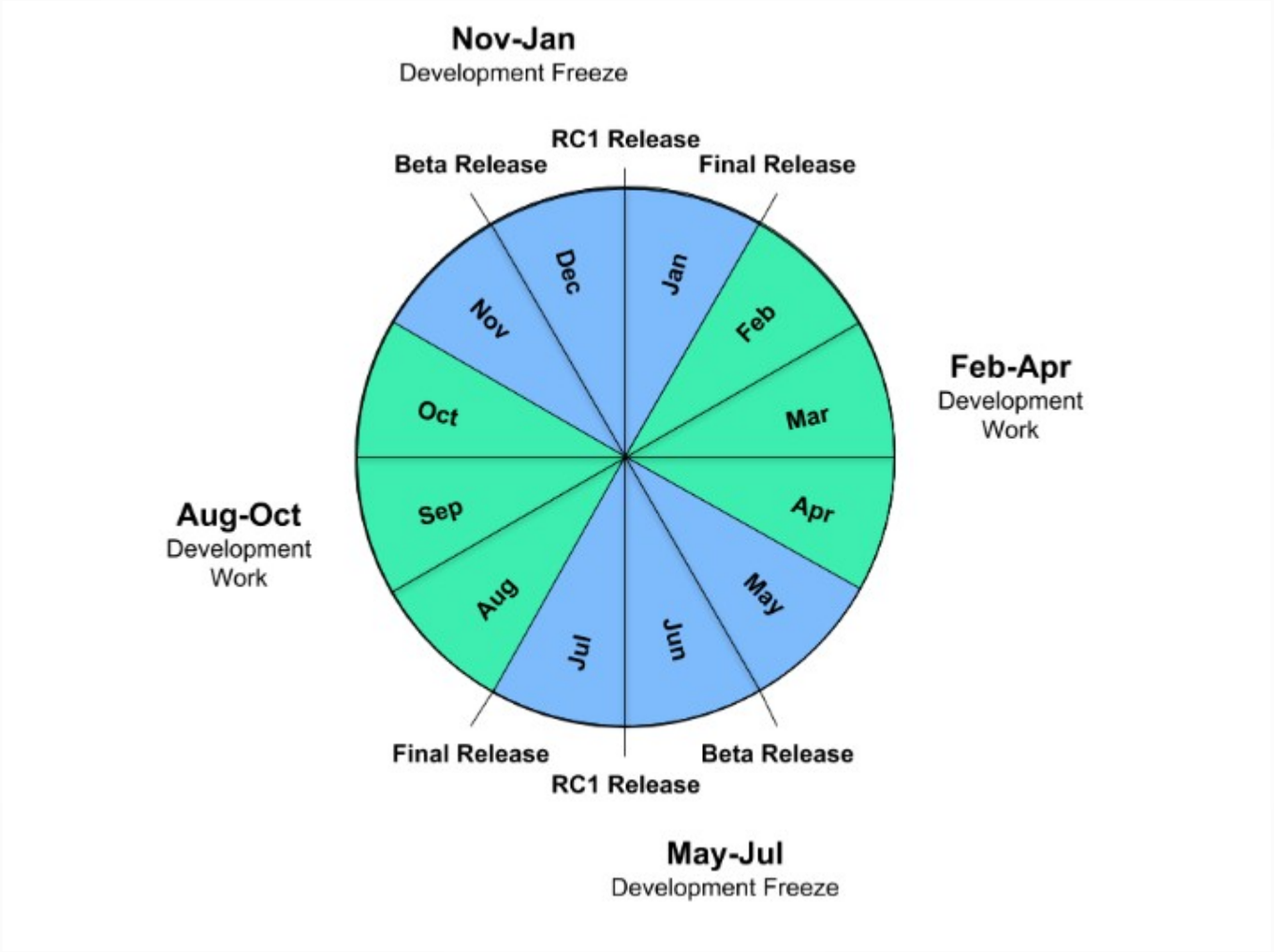
go1.6.3
go1.7.4
go1.8.2
go1.8.4
go1.9.5
go1.11
go1.11.5
go1.0.2
go1.1.2
go1.2.1
go1.3.1
go1.4.1
go1.4.3
go1.6.1
go1.7.1
go1.7.5
go1.9.1
go1.10
go1.10.4
go1.10.8
go1.14 (planned)
go1.0.1
go1.0.3
go1.1.1
go1.2
go1.2.2
go1.3.3
go1.4.2
go1.5.2
go1.6.2
go1.7.3
go1.8
go1.9
go1.9.3
go1.9.7
go1.11.2
go1.13 (planned)
2013
2014
2015
2016
2017
2018
2019
2020


Nov-Jan
Development Freeze
RC1 Release
Beta Release
Final Release
Dec
Jan
Nov
Feb
Oct
Mar
Feb-Apr
Development
Work
Sep
Apr
Aug
May
Jul
Jun
Aug-Oct
Development
Work
Final Release
Beta Release
RC1 Release
May-Jul
Development Freeze

On Nov 11, 12:30 am, Robert Schonberger <rschonber...@gmail.com>
wrote:
> I love it! what do people think of Go? what are the 1st questions?

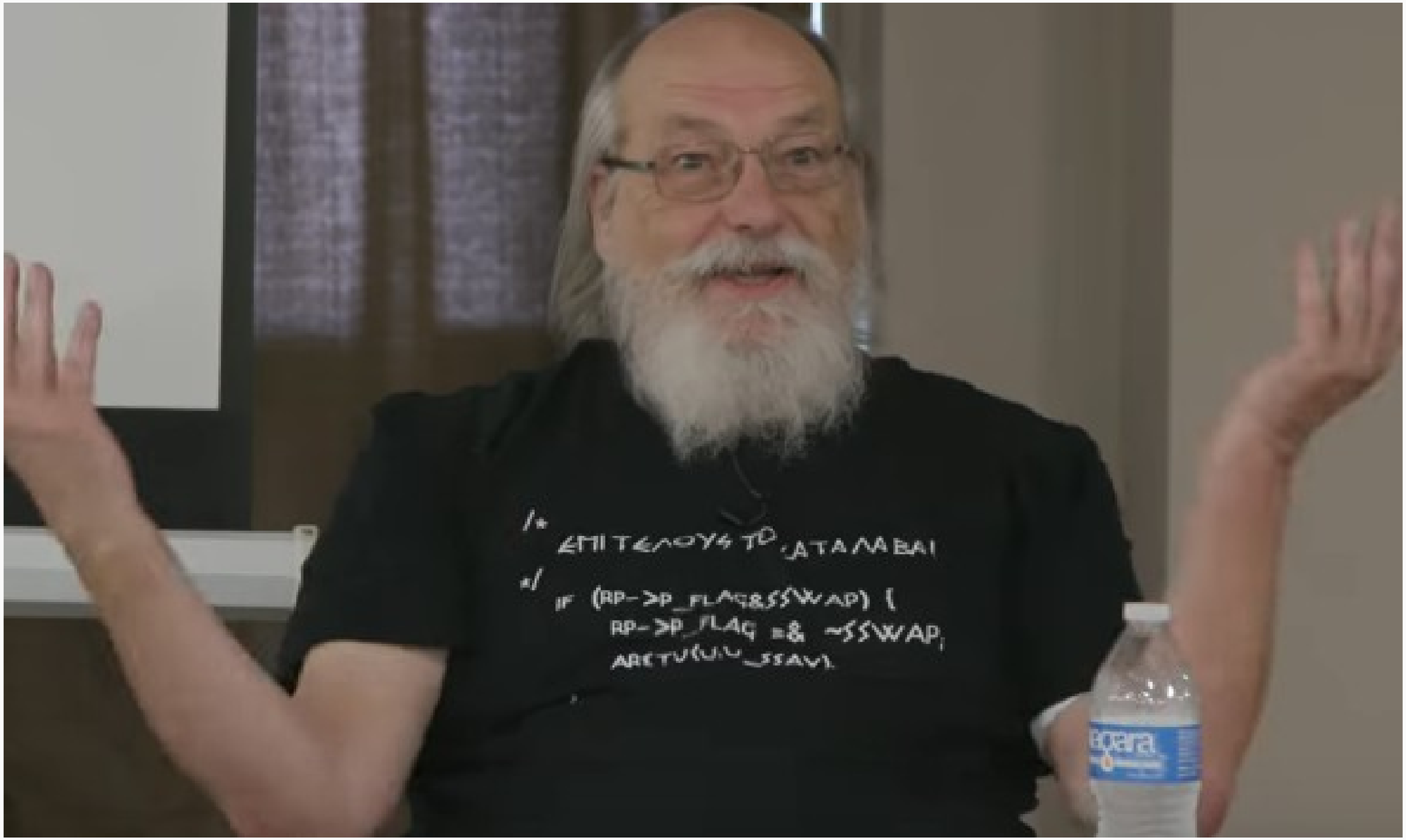
IMHO go does not provide two features a modern programming language
needs to provide :

1. Exceptions
2. Templates/Generics

```
%v     the value in a default format
       when printing structs, the plus flag (%+v) adds field names
%#v    a Go-syntax representation of the value
%T     a Go-syntax representation of the type of the value
```

The default format for %v is:

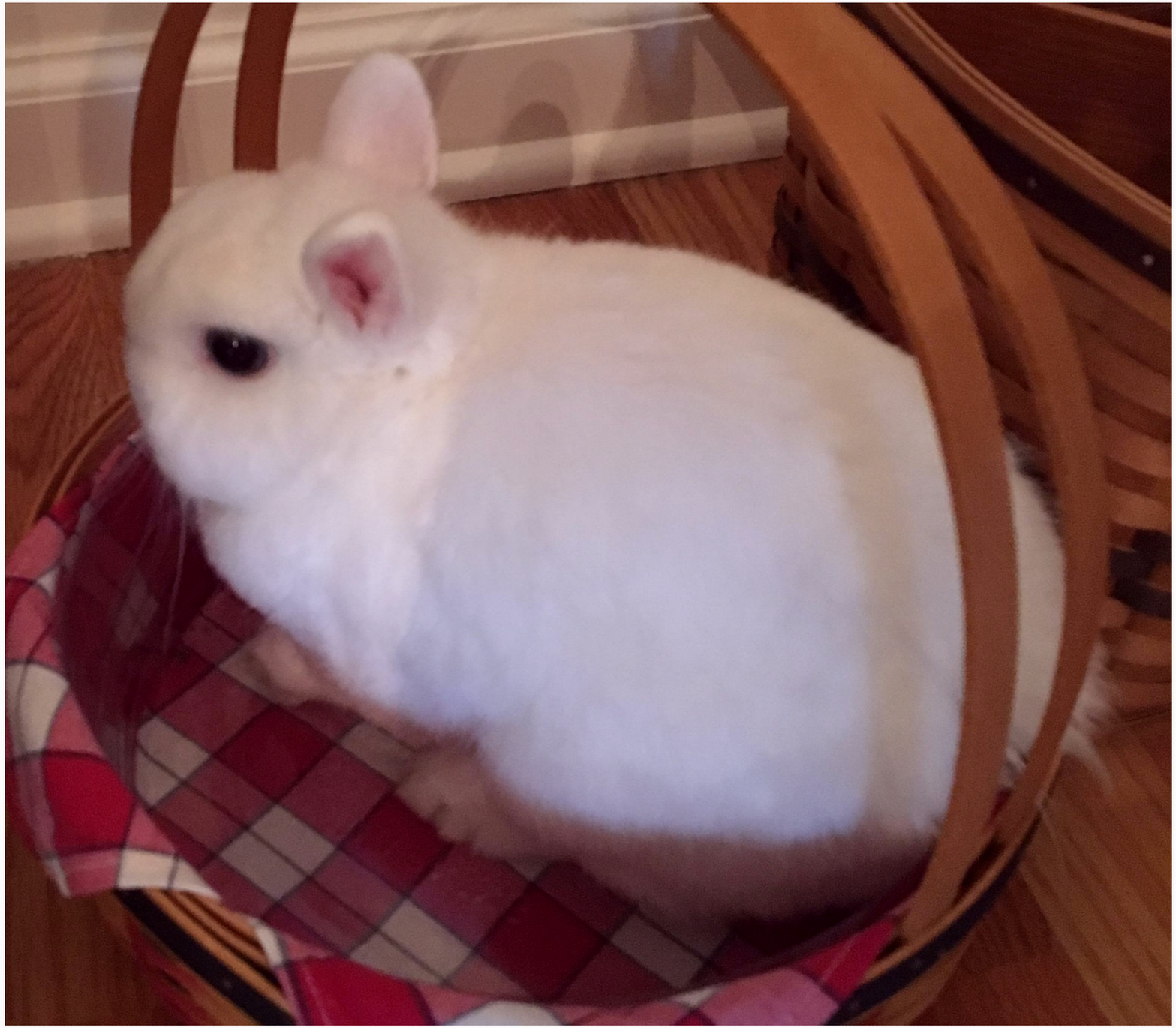
```
bool:                    %t
int, int8 etc.:          %d
uint, uint8 etc.:        %d, %#x if printed with %#v
float32, complex64, etc: %g
string:                  %s
chan:                    %p
pointer:                 %p
```

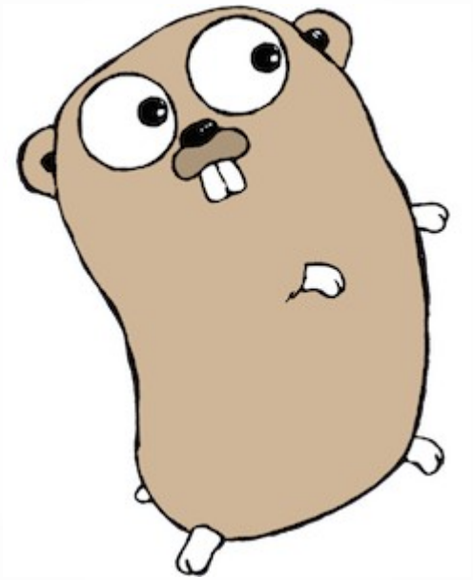

/*
ΕΠΙΤΕΛΟΥΣ ΤΟ ΔΑΤΑΜΑΒΑΙ
*/
IF (RP->P_FLAG&SSWAP) {
RP->P_FLAG =& ~SSWAP;
ARETU(U.U_ISAV);
}
Aquafina


0:03 / 2:19

Rob C. Pike

Born	1956 (age 62–63)
Nationality	Canadian
Alma mater	University of Toronto (BS) California Institute of Technology
Occupation	Software engineer
Employer	Google
Known for	Plan 9, UTF-8, Go
Spouse(s)	Renée French
Website	herpolhode.com/rob/





Pinned Tweet

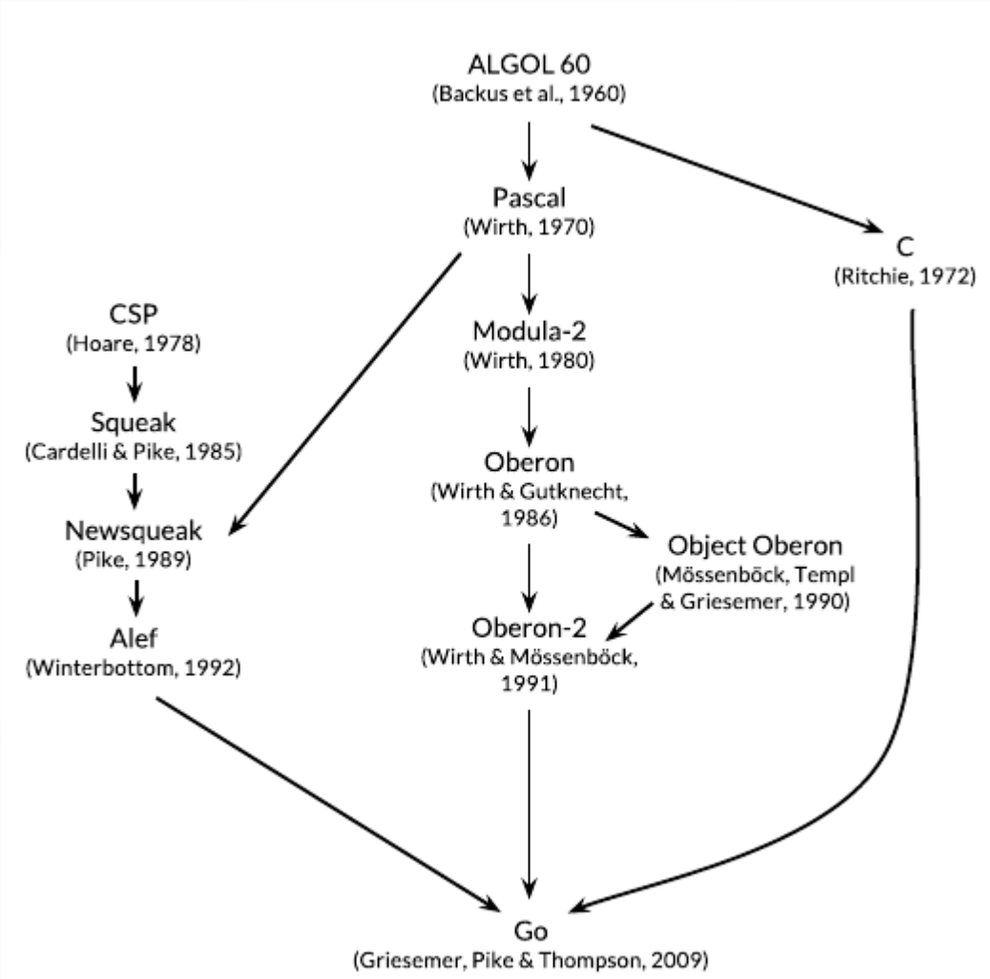
Johnny Boursiquot @jboursiquot · Jul 27

We all want to belong, to feel welcomed, wanted, and seen. I set out to find all the people who look like me at #gophercon 2019 and that led to this group shot I hope will inspire more diversity of this kind in the #golang community.

We out here. #BlackTechTwitter

6 30 175

Show this thread


ALGOL 60
(Backus et al., 1960)
Pascal
(Wirth, 1970)
C
(Ritchie, 1972)
CSP
(Hoare, 1978)
Modula-2
(Wirth, 1980)
Squeak
(Cardelli & Pike, 1985)
Oberon
(Wirth & Gutknecht, 1986)
Newsqueak
(Pike, 1989)
Object Oberon
(Mössenböck, Templ & Griesemer, 1990)
Alef
(Winterbottom, 1992)
Oberon-2
(Wirth & Mössenböck, 1991)
Go
(Griesemer, Pike & Thompson, 2009)

Programming Techniques
S. L. Graham, R. L. Rivest Editors

Communicating Sequential Processes

C.A.R. Hoare
The Queen's University
Belfast, Northern Ireland

This paper suggests that input and output are basic primitives of programming and that parallel composition of communicating sequential processes is a fundamental program structuring method. When combined with a development of Dijkstra's guarded command, these concepts are surprisingly versatile. Their use is illustrated by sample solutions of a variety of familiar programming exercises.

Key Words and Phrases: programming, programming languages, programming primitives, program structures, parallel programming, concurrency, input, output, guarded commands, nondeterminacy, coroutines, procedures, multiple entries, multiple exits, classes, data representations, recursion, conditional critical regions, monitors, iterative arrays

CR Categories: 4.20, 4.22, 4.32

T414 transputer chip

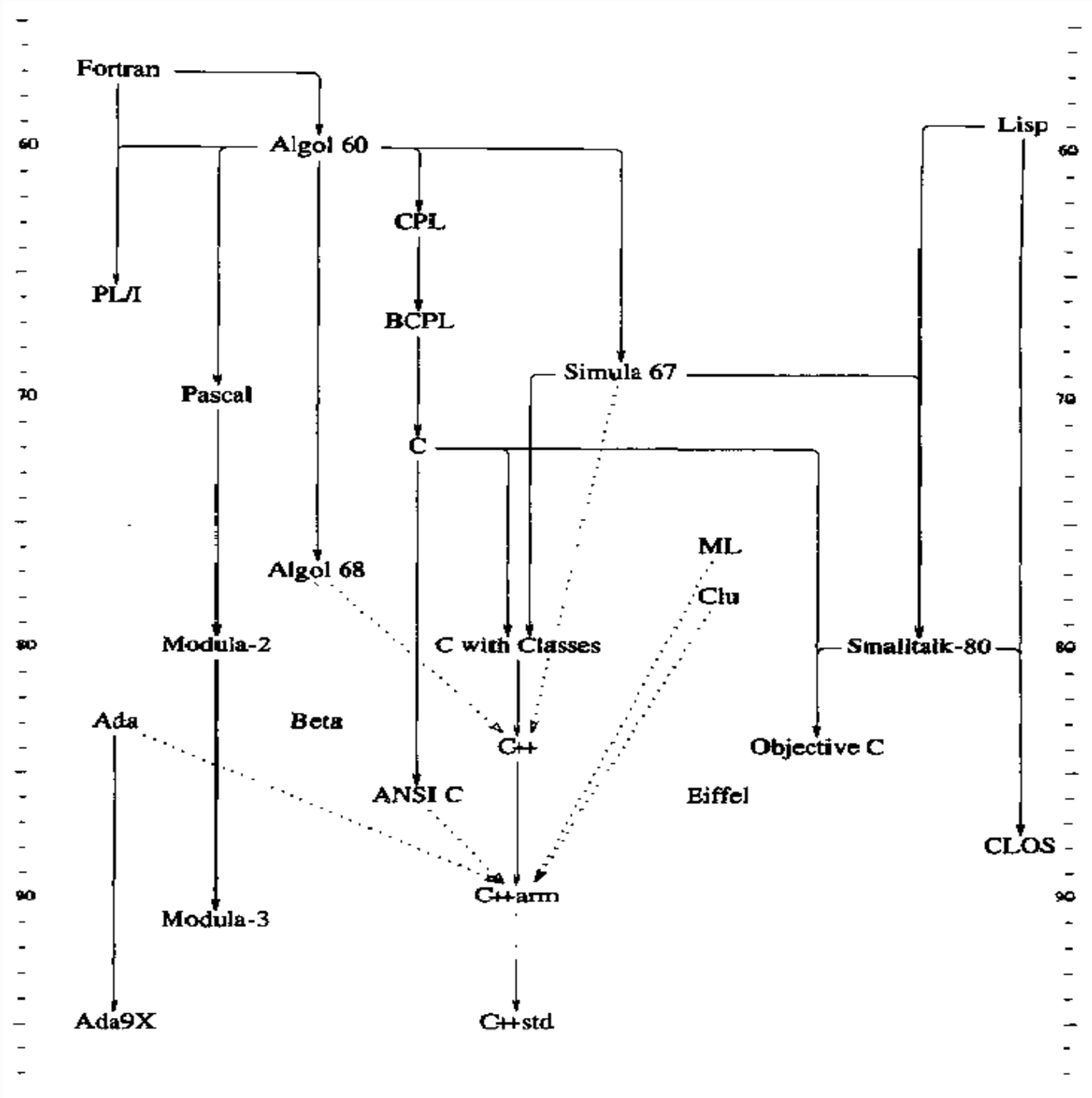
In computer science, communicating sequential processes (CSP) is a formal language for describing patterns of interaction in concurrent systems.[1] It is a member of the family of mathematical theories of concurrency known as process algebras, or process calculi, based on message passing via channels.

CSP has been practically applied in industry as a tool for specifying and verifying the concurrent aspects of a variety of different systems

The Go Programming Language

Alan A. A. Donovan
Brian W. Kernighan

ADDISON-WESLEY PROFESSIONAL COMPUTING SERIES


Fortran
Algol 60
Lisp
CPL
PL/I
BCPL
Simula 67
Pascal
C
Algol 68
ML
Clu
Modula-2
C with Classes
Smalltalk-80
Ada
Beta
C++
Objective C
ANSI C
Eiffel
CLOS
C++arm
Modula-3
Ada9X
C++std
60
70
80
90

x/website: Remove the Google logo #33021

Closed **noxer** opened this issue on Jul 10 · 11 comments

noxer commented on Jul 10 • edited

Go is perceived by some as a pure Google project without community involvement (see https://utcc.utoronto.ca/~cks/space/blog/programming/GoIsGooglesLanguage). Adding a Google logo does not help in this discussion.

I propose removing the Google logo from the website.

What version of Go are you using (`go version`)?

The current Go website (https://golang.org)

Does this issue reproduce with the latest release?

Yes

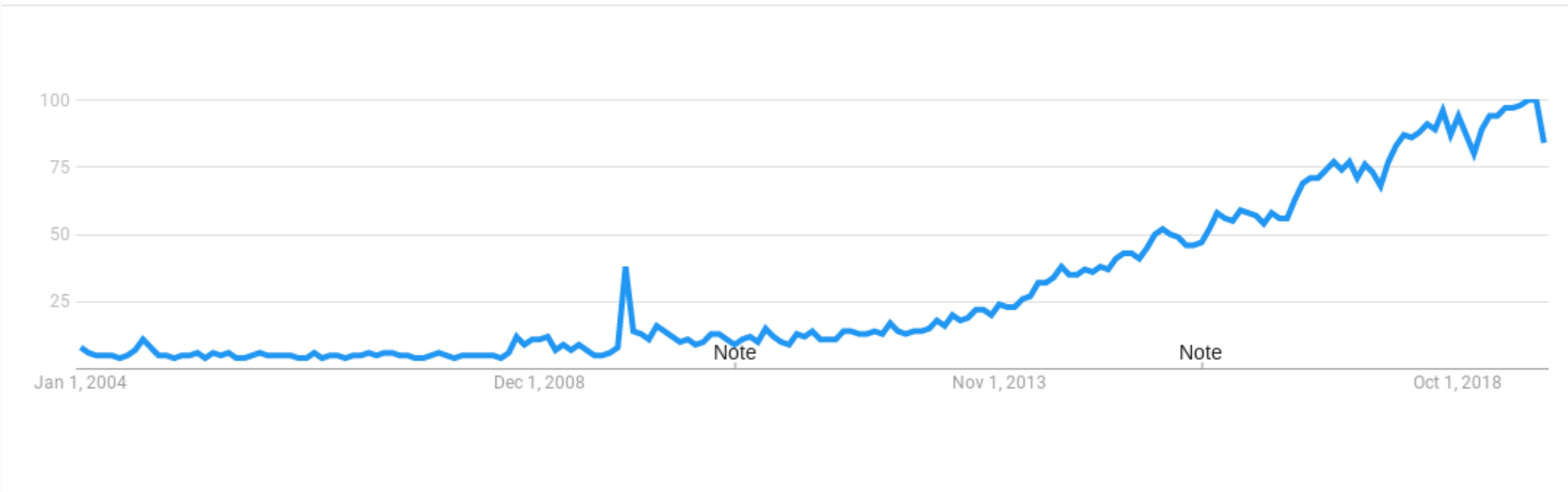
andybons commented on Jul 10 Member ...

Thanks for the issue. We spent a long time talking about it and are sensitive to this concern. It's equally important to make it clear that Google supports Go, which was missing before (Much like http://typescriptlang.org). Google pays for and hosts the infrastructure that golang.org runs on and we hope the current very small logo is a decent compromise.

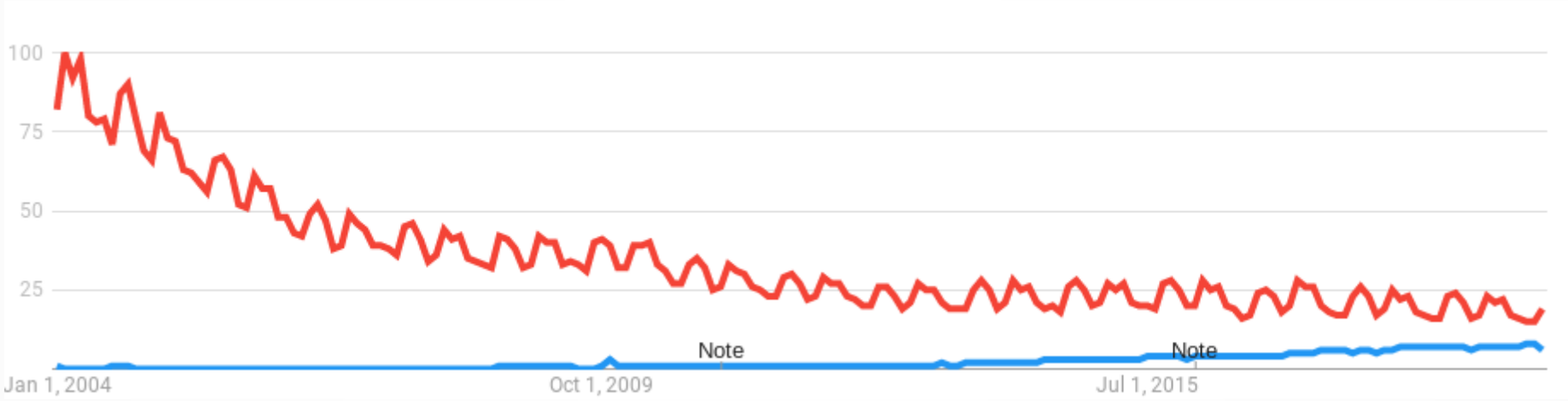
👍 58 👎 2 ❤️ 4 🚀 3

andybons closed this on Jul 10

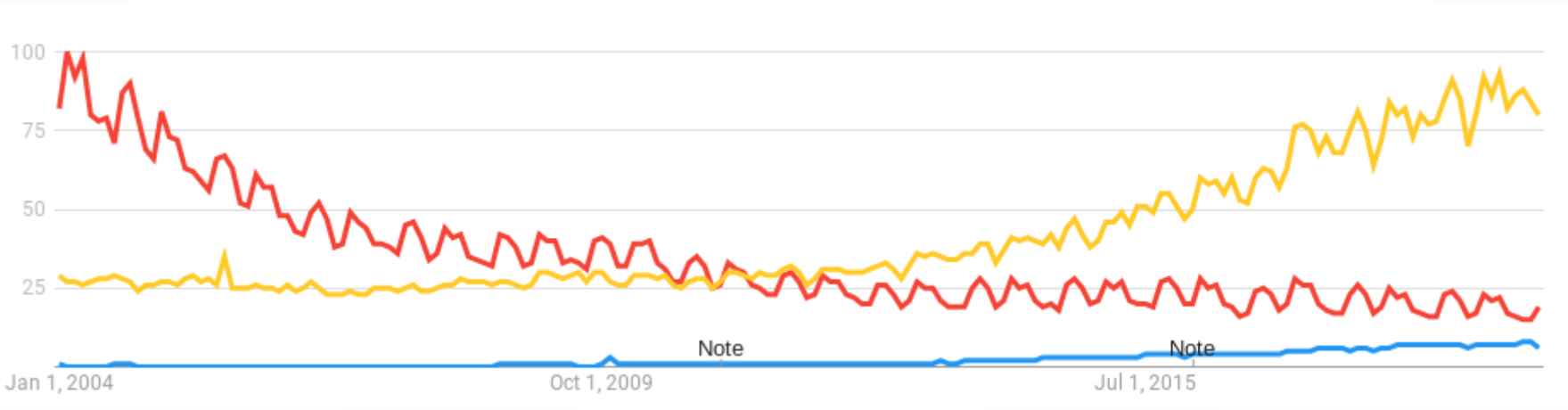
Google Trends for Go:



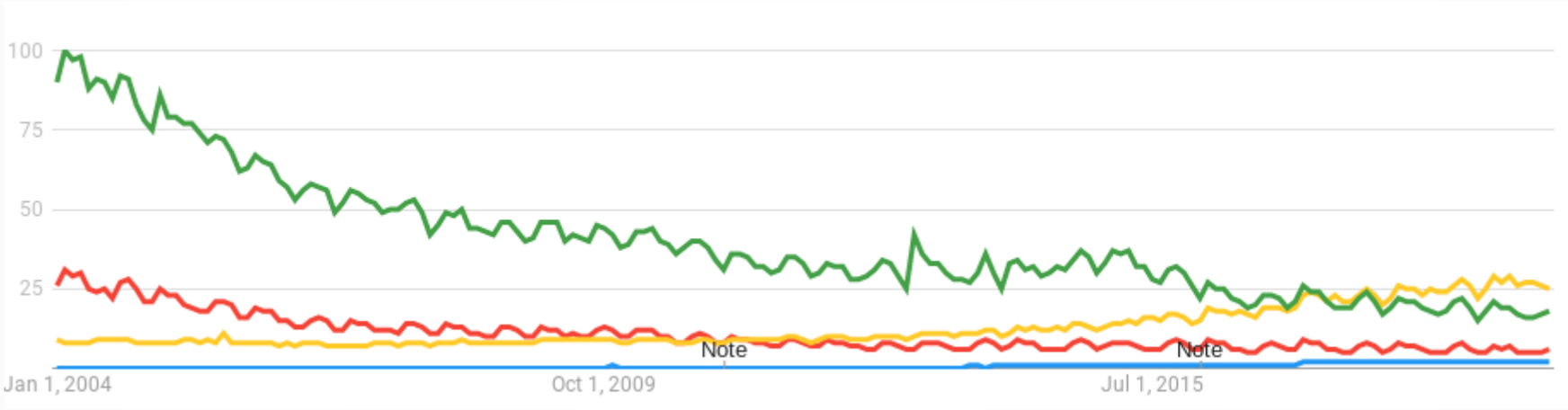
Comparing to C++:

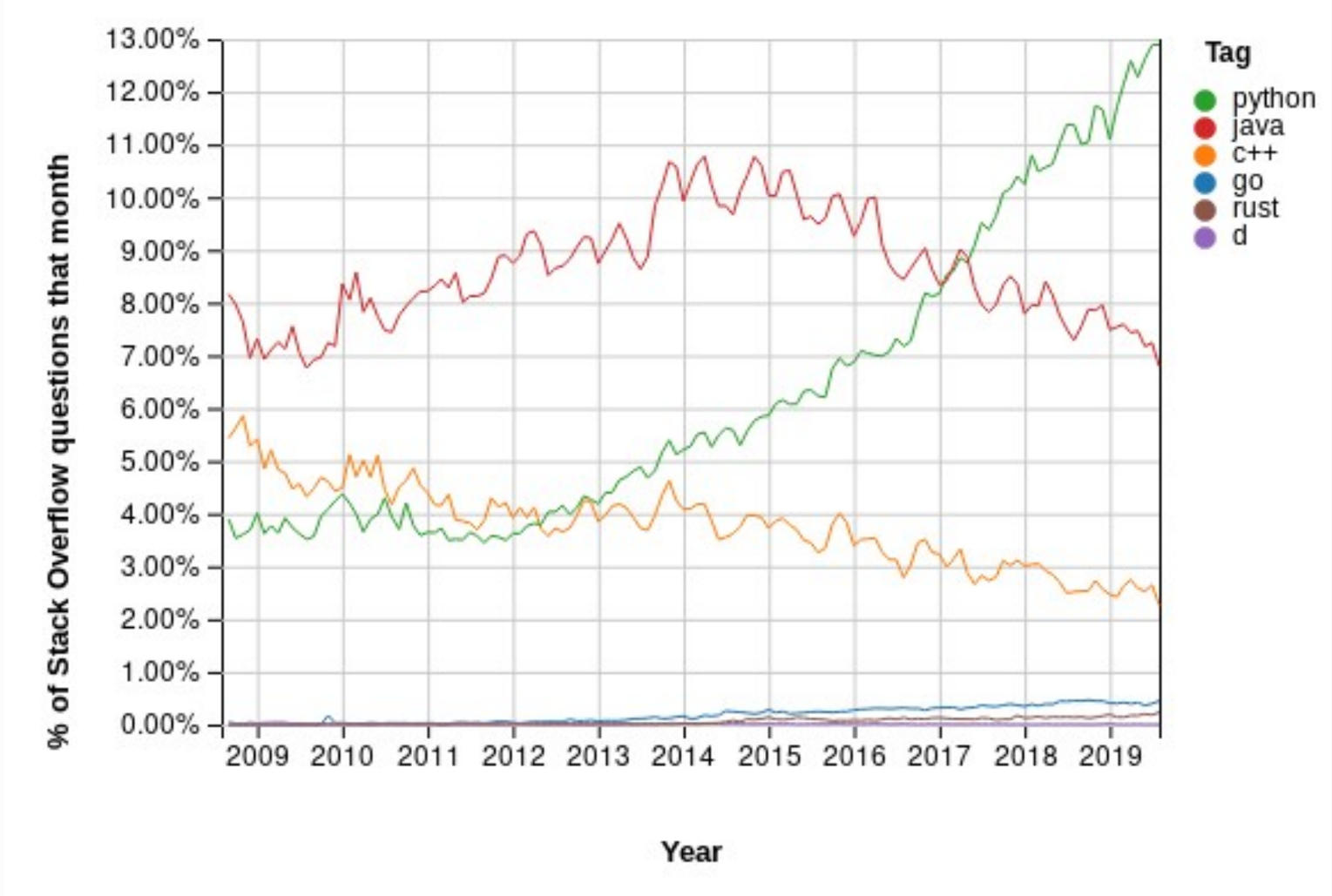


Adding in Python:



And Java:




% of Stack Overflow questions that month
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python
java
c++
go
rust
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Lang.NEXT 2014

Panel: Systems Programming in 2014 and Beyond

May 19, 2014 at 11:19AM

by Charles Torre, Bjarne Stroustrup, Andrei Alexandrescu, Rob Pike, Niko Matsakis

★★★★★ 7 ratings 15 comments

Tweet Share Share

GopherFest 2015: Rob Pike on the move from C to Go in the toolchain

Why move the compiler to Go?

Not for validation; we have more pragmatic motives:

- Go is easier to write (correctly) than C.
- Go is easier to debug than C (even absent a debugger).
- Go is the only language you'd need to know; encourages contributions.
- Go has better modularity, tooling, testing, profiling, ...
- Go makes parallel execution trivial.

Already seeing benefits, and it's early yet.

Design document: golang.org/s/go13compiler

"We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard.

[Address at Rice University, September 12 1962]"

— John F. Kennedy

https://tour.golang.org
https://play.golang.org