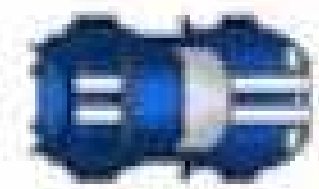
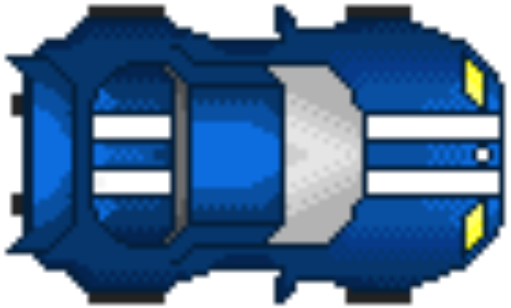


Racecar

A Programming Language for Kids

Sam Kohn: Project Manager Guru
Alex Fields: Language Guru Guru
Mason Silber: System Integrator Guru
Jeremy Spencer: System Architect Guru
Colfax Selby: Verifier and Validator and Text Box Guru



Big Problems Facing America

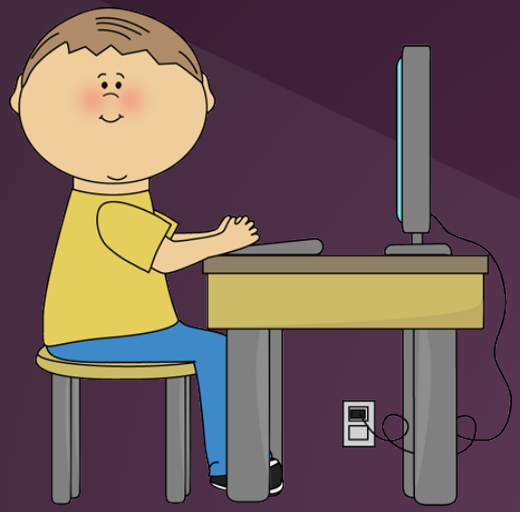
- Global Warming
- Poverty
- OS
- Learning to drive before learning to code

DEMO

Guiding Principle: Make Everything Easy

Buzzwords

READABLE
TEACH
ENGAGING
EASY
RACECAR
Engaging
Easy
Readable
RaceCar
teach



Kids

Teachers

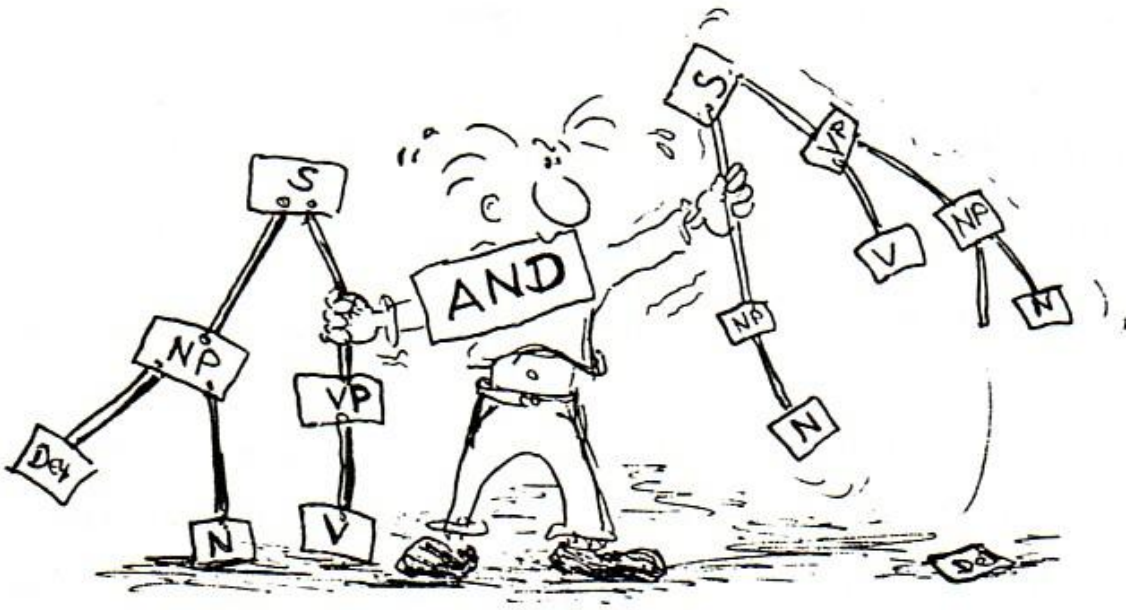
Parents

Language design

Lesson Plan

Syntax

- Minimize punctuation
  - Function calling like in OCaml and Haskell
  - Newline-terminated statements unlike C and Java
- Keywords are real words!
  - `drive`
  - `turn`
  - `number`
  - `word`
  - `define`
  - `set`
  - `etc.`



Semantics

Guiding principle: It should sound like English

Examples:

- `drive forward 5 steps`
- `turn left`
- `define myFun using myVar (number)`
- `set myVar to getCarPosition`
- `repeat 10 times`

Development and Runtime Environments

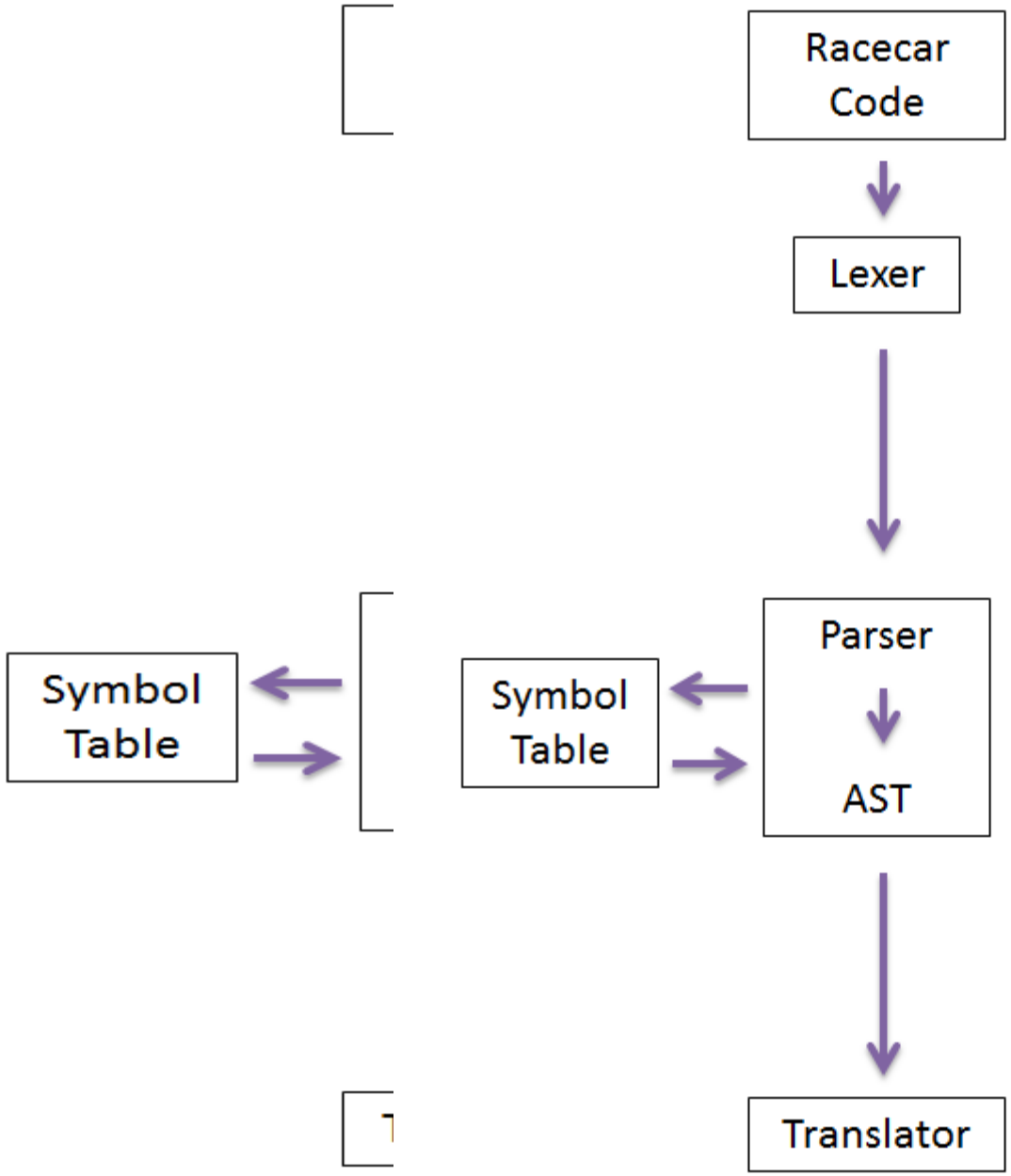
Development Software

- Git & GitHub
- Google Drive
- All kinds of text editors

Runtime Environment

- Custom-built GUI to run Racecar programs
  - Python Lex/Yacc (PLY)
  - Python TkInter framework
  - Python image library (PIL)
- Remember, it's supposed to be easy!
  - Immediate visual output of code
  - Fully integrated development environment
  - Error checking and code verification

System Architecture



wards 5 steps

rive",DRIVE)
rds",FORWARD)
",NUMBER)
eps",STEPS)

mand (None)

5 (NUMBER)

on.FORWARDS)\n

Semantic Analyzer

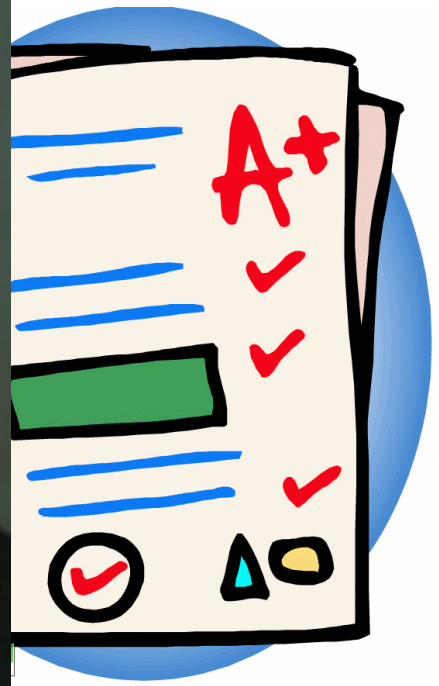
Semantic Analyzer

- Traverses AST twice
  - First
    - checks for functions and adds them to the symbol table
  - Second
    - everything else
    - type checking
    - scoping
- Allows for function calls to appear before declarations

Testing

Frameworks

- Test suite:
  - Iterative t
  - Specific te
    of the com
  - End to en
- Code valid
  standard
  - Style guid
  - Similar to



Lessons Learned

Or: How I learned to stop worrying and love Python

What went right

- Using Python for everything

Python: the Racecar of real-people programming languages

- Iterative + end-to-end testing

- Team Roles
  - but not binding

What went wrong

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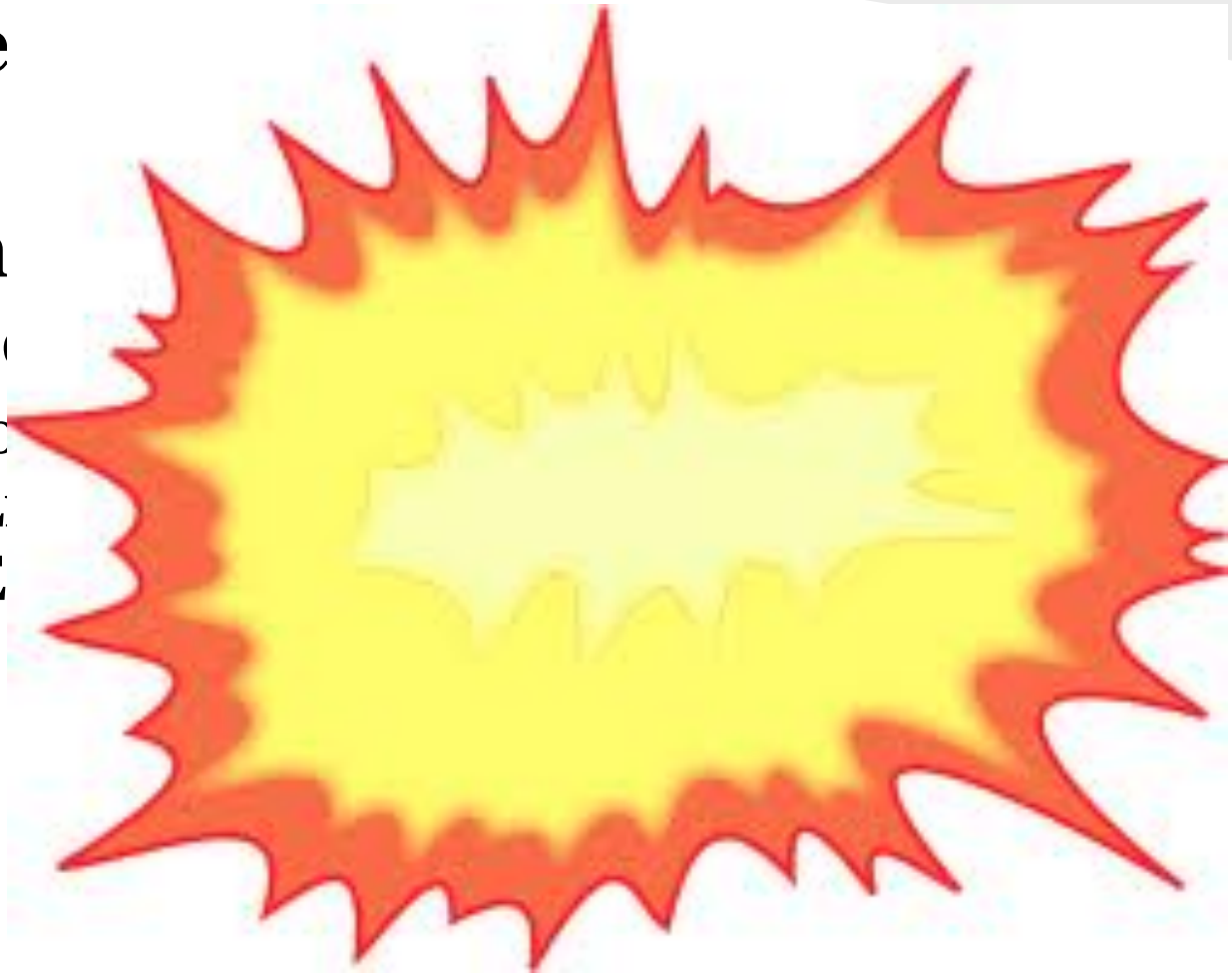

Big Problems Facing America

- Global Warming
- Poverty
- OS

TARGET
TARGET
TARGET

- ~~Learning to drive before learning to code~~

Good luck!

Thank You!

Any Questions?