



“Syntactic sugar causes cancer of the semicolon.”

- *Alan Perlis*

CS302: Paradigms of Programming

Functional Programming in Scheme

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Designing a programming language

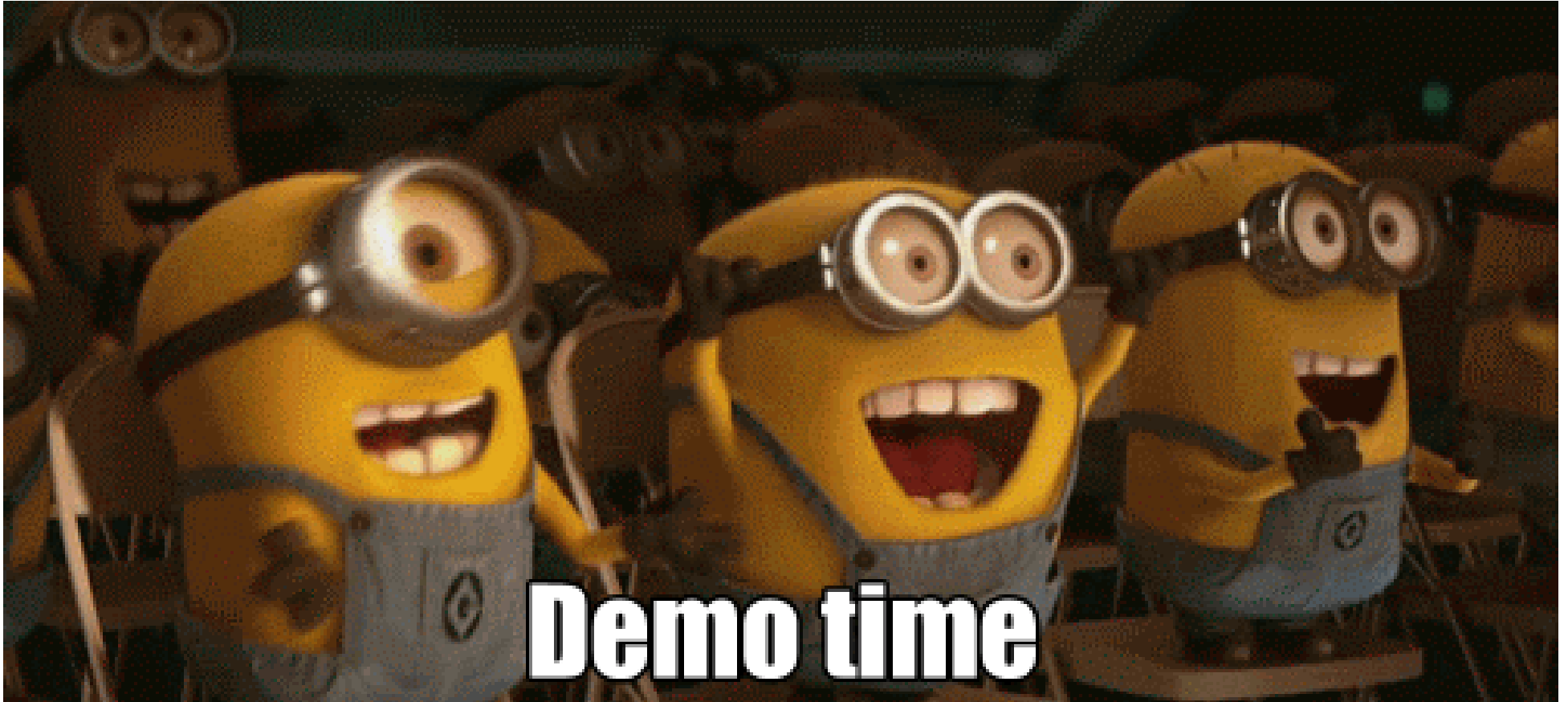
- Syntax
 - Defined by the grammar
- Semantics
 - Meaning of each construct that is enabled by the grammar
- Evaluator/Interpreter
 - Execute the programs written using the syntax based on the corresponding semantics

Our vehicle: Scheme

- A dialect of **LISP** (for *LISt Processing*)
 - The second oldest PL that is still in use today
 - FORTRAN being the first one
- Our evaluator: **DrRacket**
 - A popular cross-platform tool to learn Lisp-like languages and design new languages
 - You could also use the *mit-scheme* command-line interpreter

The Elements of Programming

- Primitive expressions
 - Things whose semantics are pre-defined in the language
- Means of combination
 - Building compound elements from primitive ones
- Means of abstraction
 - Ability to use compound elements as units themselves



Tribute to another giant

- Coined the term *Artificial Intelligence*
- Designed several PLs:
 - Invented LISP
 - Influenced the design of ALGOL
- Invented garbage collection
- Turing Award in 1971
- John McCarthy (1927 – 2011)
- **Next class: Monday 10 am**

