

# CSE 3302

Lecture 26: Language implementation  
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Nate Nystrom  
University of Texas at Arlington

# Language definition

- **Syntax** defines the structure of a program
  - set of rules defining which symbols are a legally structured program
- **Semantics** defines the “meaning” of a program
  - without semantics, programs are just sequences of characters

# Syntax

- Syntax defined by a **context-free grammar**
- Example:
  - $\text{Exp} ::= \text{Exp} + \text{Term} \mid \text{Term}$
  - $\text{Term} ::= \text{Term} * \text{Factor} \mid \text{Factor}$
  - $\text{Factor} ::= \text{INTEGER}$
- Expressions with + and \* operators over integers
  - \* has higher precedence than +
    - $1+2*3$  parses as  $1+(2*3)$  not as  $(1+2)*3$