Announcements

- Homework 38 due Wednesday 12/3 @ 11:59pm
- Quiz 3 released Wednesday, due Thursday 12/4 @ 11:59pm
- No videos for Lecture 38 on Friday 12/5
- Come to class and take the final survey
- There will be a screencast of live lecture (http://goo.gl/hyUTca)
- Final exam held on Thursday 12/18 3pm-6pm
- 30 hours of review sessions next week! Monday - Friday 11am-6pm (mostly in 271 Soda)

Syntactic Ambiguity in English

<table>
<thead>
<tr>
<th>Sentence</th>
<th>Noun</th>
<th>Verb Phrase</th>
<th>Subordinate Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programs must be written for people to read</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1Preface of Structure and Interpretation of Computer Programs by Harold Abelson and Gerald Sussman with Julie Sussman

Syntax Trees

- program (noun)
  - a series of coded software instructions
- program (verb)
  - provide a computer with coded instructions

Programs must be written for people to read

must (verb)
- be obliged to
must (noun)
- dampness or mold

Definitions from the New Oxford American Dictionary
Representing Syntactic Structure

A Tree represents a phrase:
- **tag** -- What kind of phrase (e.g., S, NP, VP)
- **branches** -- Sequence of Tree or Leaf components

A Leaf represents a single word:
- **tag** -- What kind of word (e.g., N, V)
- **word** -- The word

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Context-Free Grammar Rules

A grammar rule describes how a tag can be expanded as a sequence of tags or words

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Exhaustive Parsing

Expand all tags recursively, but constrain words to match input

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Scoring a Tree Using Relative Frequencies

Not all syntactic structures are equally common

teacher strikes idle kids

Rule frequency per 100,000 tags

<table>
<thead>
<tr>
<th></th>
<th>S</th>
<th>VP</th>
<th>NN</th>
<th>teacher</th>
<th>5</th>
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(Demo)