

## First half of the course:

- ▶ Introduction (Aug 23–25)
- ▶ Regular expressions (Aug 28–30)
- ▶ Edit distance (Sept 1)
- ▶ Information theory (Sept 6–8)
- ▶ Language models (Sept 11–18)
- ▶ Parts of speech and HMMs (Sept 18–27)
- ▶ Parsing (**Sept 29–Oct 4**)
- ▶ Review (Oct 6–9)
- ▶ Midterm (Oct 11)

## Parsing unit:

- ▶ Constituents, parsing, and context free grammars (**Today**)
- ▶ Recursive descent parsing (next week Monday, in lab)
- ▶ CKY parsing (next week Wednesday)

## Today:

- ▶ Why we care about parsing
- ▶ Grammar and parsing examples
- ▶ Formal definitions
- ▶ Parsing algorithms

*Maciano's*



Pizza & Pastaria

At times one of the girls would start a song, the others joining in the chorus, or one would rise and dance, gracefully swaying to the music of a harp played by a companion.

No one I know has ever seen them or heard of them.

The mountain has steep sides and a broad, hollow top, like a basin, and in this basin the Flatheads have their dwellings.

Ozma had many arrangements to make before she could leave her throne and her palace in the Emerald City.

Dorothy wore around her waist the Nome King's Magic Belt, which protected her from harm.

So they turned to the right and, following the web found that it seemed to spread in a regular circle.

So they wandered among the bushes and finally came to a shallow pool of water, formed by a small bubbling spring.

The Mist Maids came nearer, holding out their arms.

Fragrant wild flowers were scattered throughout the grass.

You must realize that while I am a more powerful fairy than any other inhabitant of Oz.

It took them a good two hours to reach the foot of the round, flat mountain.

Dorothy knew at once why these mountain people were called Flatheads.

The book's grammar for  $\mathcal{L}_0$ , Fig 17.3

*Sentence*  $\rightarrow$  *NounPhrase VerbPhrase*

*NounPhrase*  $\rightarrow$  *Pronoun* | *ProperNoun* | *Det Nominal*

*Nominal*  $\rightarrow$  *Nominal Noun* | *Noun*

*VerbPhrase*  $\rightarrow$  *Verb* | *Verb NounPhrase* |  
*Verb NounPhrase PrepPhrase* | *Verb PrepPhrase*

*PrepPhrase*  $\rightarrow$  *Preposition NounPhrase*

Simpler language:

*Sentence* → *NounPhrase VerbPhrase*

*NounPhrase* → *Article Article Noun*

*VerbPhrase* → *Verb NounPhrase PrepPhrase*

*PrepPhrase* → *Preposition NounPhrase*

Language for next time

*Sentence* → *NounPhrasePredicate*

*NounPhrase* → *ConcNounPhrase* | *AbsNounPhrase*

*ConcNounPhrase* → *ArticleAdjectiveListNoun*

*AdjectiveList* → *AdjectiveAdjectiveList* |  $\epsilon$

*AbNounPhrase* → *ThatSentence*

(continued...)

## Language for next time (continued)

*Predicate* → *VerbPhrase VerbModifier*

*VerbPhrase* → *LinkingVerbPhrase* | *TransitiveVerbPhrase* |  
*IntransitiveVerbPhrase*

*LinkingVerbPhrase* → *LinkingVerbAdjective*

*TransitiveVerbPhrase* → *TransitiveVerbNounPhrase*

*IntransitiveVerbPhrase* → *IntransitiveVerb*

*VerbModifier* → *PrepositionalPhrase* | *Adverb* |  $\epsilon$

*PrepositionalPhrase* → *PrepositionNounPhrase*



Coming up:

- ▶ Do HMMs & POS programming assignment (Wed, Oct 4)
- ▶ Read J&M 17.(0-6). (Mon, Oct 2)
- ▶ Take grammars quiz (Tues, Oct 3)
- ▶ Take CKY parsing quiz (Thurs, Oct 5)
- ▶ Do CKY parsing programming assignment (Mon, Oct 9)
- ▶ Take midterm (Wed, Oct 11)