CS/ENGRI 172, Fall 2002
11/4/02: Lecture Twenty-Eight Handout

Topics: Context-free grammars (cont).

Example CFG

Recall our two structural analyses of "list all flights on Tuesday"; here we use a "linear" notation (more compact than trees) with brackets indicating some of the constituents:
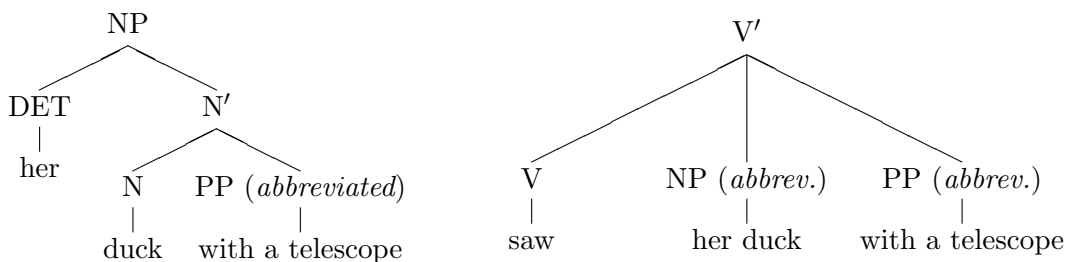
$$\text{list} \quad [\text{all} \quad [\text{flights} \quad \text{on} \quad \text{Tuesday}]_{N'}]_{NP}$$
$$\text{list} \quad [\text{all} \quad \text{flights}]_{NP} \quad [\text{on} \quad \text{Tuesday}]_{PP}$$

- Terminals: list, all, flights, on, Tuesday

- Non-terminals: S, NP, N′, PP, V, DET, N, P

- Start non-terminal: S

- Rewrite rules:

(1)	S	→	V NP	(7)	N	→ flights
(2)	S	→	V NP PP	(8)	N′	→ N PP
(3)	V	→	list	(9)	PP	→ P NP
(4)	NP	→	DET N′	(10)	P	→ on
(5)	NP	→	DET N	(11)	NP	→ N
(6)	DET	→	all	(12)	N	→ Tuesday

X-bar example[1]

Recall that XP is equivalent to X″.

More examples

- What sentences does the CFG with terminals a,b; single (and hence start) nonterminal S; and rewrite rules "S →ab" and "S →aSb" produce?

- Is there a CFG producing all and only sentences of the form $\underbrace{a\ldots a}_{n}\underbrace{b\ldots b}_{n}\underbrace{c\ldots c}_{m}\underbrace{d\ldots d}_{m}$, $n \geq 1, m \geq 0$?

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[1]By the way, the on-line version of Merriam-Webster's dictionary, www.m-w.com, includes *to accompany or escort* (as in "I saw him to the door") and *to meet a bet* (as in poker) as other senses of "see" besides the ones we thought of, and *darling* (British English) as another sense of "duck". There is indeed an entry for *duck* as a type of closely woven, generally cotton fabric.