

LING5702: Lecture Notes 12

Memory Limits in Sentence Processing

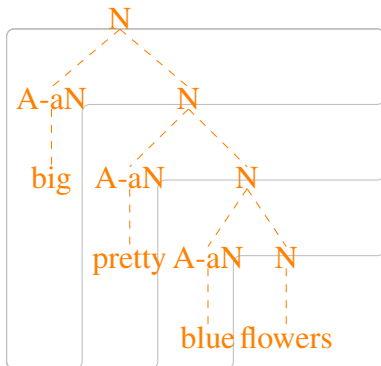
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12.1 Memory bounds [Chomsky & Miller, 1963, Abney & Johnson, 1991] 1

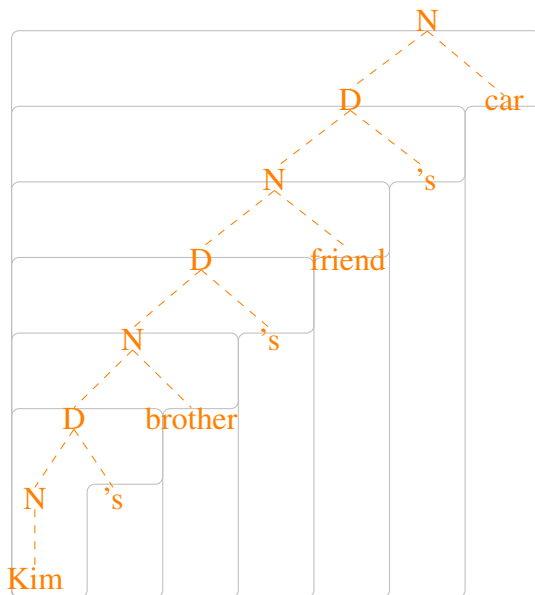
12.1 Memory bounds [Chomsky & Miller, 1963, Abney & Johnson, 1991]

The left-corner parsing model from the previous notes also economizes memory like people do.

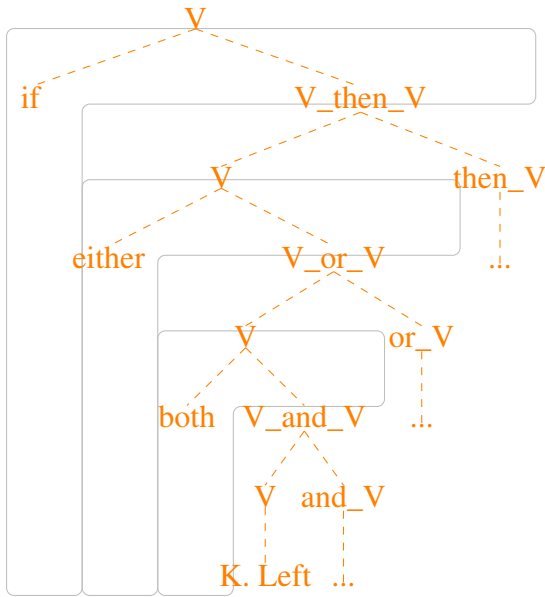
- right-branching structures use only one derivation fragment:



- left-branching structures use only one derivation fragment:



- only center-embedding structures require multiple derivation fragments:



It's consistent with observations of relative difficulty of center embedding [Miller & Isard, 1964].

References

- [Abney & Johnson, 1991] Abney, S. P. & Johnson, M. (1991). Memory requirements and local ambiguities of parsing strategies. *J. Psycholinguistic Research*, 20(3), 233–250.
- [Chomsky & Miller, 1963] Chomsky, N. & Miller, G. A. (1963). Introduction to the formal analysis of natural languages. In *Handbook of Mathematical Psychology* (pp. 269–321). New York, NY: Wiley.
- [Miller & Isard, 1964] Miller, G. A. & Isard, S. (1964). Free recall of self-embedded english sentences. *Information and Control*, 7, 292–303.