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Computational Linguistics II: Parsing
The Earley Parsing Method

The Grammar

- S → NP VP
- NP → DET N | DET N'
- VP → V NP | VP PP
- N' → N PP
- PP → P NP
- DET → the
- N → man | woman | telescope
- V → saw
- P → with

Illustration of the Earley Method

Sentence: *The man saw the woman with the telescope*

itemset 0

S → • NP VP @1
NP → • DET N @1
NP → • DET N' @1
DET → • the @1

completed 0

empty

the

itemset 1

NP → DET • N @1
NP → DET • N' @1
N → • man @2
N → • woman @2
N → • telescope @2
N' → • N PP @2

completed 1

DET → the • @1

man

itemset 2

S → NP • VP @1
N' → N • PP @2
VP → • V NP @3
VP → • VP PP @3
V → • saw @3
PP → • P NP @3
P → • with @3

completed 2

N → man • @2
NP → DET N • @1

saw

saw

itemset 3

VP → V • NP @3
NP → • DET N @4
NP → • DET N' @4
DET → • the @4

completed 3

V → saw • @3

the

itemset 4

NP → DET • N @4
NP → DET • N' @4
N → • man @5
N → • woman @5
N → • telescope @5
N' → • N PP @5

completed 4

DET → the • @4

woman

itemset 5

VP → VP • PP @3
N' → N • PP @5
PP → • P NP @6
P → • with @6

completed 5

N → woman • @5
NP → DET N • @4
VP → V NP • @3
S → NP VP • @1

with

itemset 6

PP → P • NP @6
NP → • DET N @7
NP → • DET N' @7
DET → • the @7

completed 6

P → with • @6

the

itemset 7

NP → DET • N @7
NP → DET • N' @7
N → • man @8
N → • woman @8
N → • telescope @8
N' → • N PP @8

completed 7

DET → the • @7

telescope

itemset 8

N' → N • PP @8
VP → VP • PP @3
unnecessary

completed 8

N → telescope • @8
NP → DET N • @7
PP → P NP • @6
VP → VP PP • @3
N' → N PP • @5
S → NP VP • @1
NP → DET N' • @4
VP → V NP • @3