

Appendix A.

Test corpus:

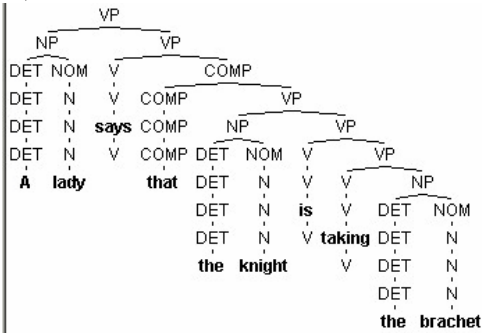
- 1 A hart runs into King Arthur's hall.
- 2 A white brachet is next to the hart.
- 3 A group of black hounds ran behind the hart.
- 4 The hart runs next to the Round Table.
- 5 The brachet bites the hart's buttock.
- 6 A knight arises.
- 7 The knight picks up the brachet.
- 8 The knight mounts his horse.
- 9 The knight rides his horse.
- 10 The knight carries the brachet.
- 11 A lady says that the knight is taking the brachet.
- 12 The lady says that the brachet is hers.
- 13 The lady says that she wants the brachet.
- 14 Merlin says that Sir Gawain must bring the hart to King Arthur's hall.
- 15 Merlin says that Sir Tor must bring the brachet to the hall.
- 16 Merlin says that Sir Tor must either bring the knight to Arthur's hall or else slay him.
- 17 An elder says that a white hart comes to a place.
- 18 The elder says that a group of hounds chased the hart.
- 19 The elder says that a white brachet is next to the hart.
- 20 Sir Tor mounts his horse.
- 21 Sir Tor rides his horse in the direction of the knight who took the brachet.
- 22 Sir Tor says that you shall say that you are sent by Sir Tor, who seeks the knight and the brachet.
- 23 A dwarf says that he knows that Sir Tor seeks the knight.
- 24 The dwarf says that he will bring Sir Tor to the knight.
- 25 Sir Tor goes to a pavilion.
- 26 The lady is sleeping in the pavilion.
- 27 Sir Tor finds the lady at the pavilion.
- 28 Sir Tor finds the brachet at the pavilion.
- 29 The brachet bays in the direction of Sir Tor.
- 30 Sir Tor spies the brachet.
- 31 Sir Tor takes the brachet.
- 32 Sir Tor gives the brachet to the dwarf.
- 33 A noise causes the lady to come from the pavilion.
- 34 The noise causes a group of damosels to come from the pavilion.
- 35 The lady asks Sir Tor if he is taking the brachet from her.
- 36 Sir Tor says to the lady that he is taking the brachet from her.
- 37 Sir Tor says that he sought the brachet from King Arthur's hall to here.

Appendix B

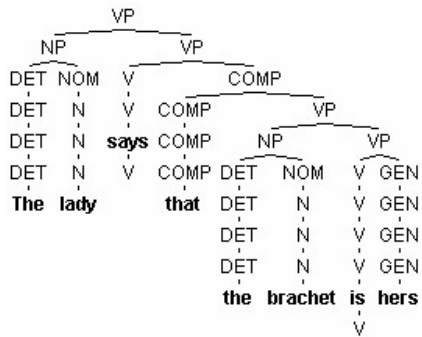
Outputs of textbook-based grammar for each sentence (1-37)

<p>(1)</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- DET1[DET] NP1 --- NOM1[NOM] VP2 --- V1[V] VP2 --- PP[PP] DET1 --- DET2[DET] DET1 --- N1[N] NOM1 --- N2[N] V1 --- runs[runs] PP --- P1[P] PP --- NP2[NP] DET2 --- DET3[DET] DET2 --- N3[N] N1 --- hart[hart] P1 --- into[into] NP2 --- DET4[DET] NP2 --- NOM2[NOM] DET3 --- DET5[DET] DET3 --- N4[N] DET4 --- DET6[DET] DET4 --- N5[N] DET5 --- DET7[DET] DET5 --- N6[N] DET6 --- s[s] DET7 --- hall[hall] </pre>	<p>(7)</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- DET1[DET] NP1 --- NOM1[NOM] VP2 --- V1[V] VP2 --- NP2[NP] DET1 --- DET2[DET] DET1 --- N1[N] NOM1 --- N2[N] V1 --- picks[picks] V1 --- up[up] NP2 --- DET3[DET] NP2 --- NOM2[NOM] DET2 --- DET4[DET] DET2 --- N3[N] DET3 --- DET5[DET] DET3 --- N4[N] DET4 --- the[the] DET5 --- braket[braket] </pre>
<p>(2) *partial</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- DET1[DET] NP1 --- NOM1[NOM] VP2 --- V1[V] VP2 --- PP[PP] DET1 --- DET2[DET] DET1 --- N1[N] NOM1 --- N2[N] V1 --- is[is] PP --- P1[P] PP --- NP2[NP] DET2 --- DET3[DET] DET2 --- N3[N] N1 --- braket[braket] P1 --- next[next] NP2 --- DET4[DET] NP2 --- NOM2[NOM] DET3 --- DET5[DET] DET3 --- N4[N] DET4 --- DET6[DET] DET4 --- N5[N] DET5 --- the[the] DET6 --- hart[hart] </pre>	<p>(8)</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- NP2[NP] NP1 --- NOM1[NOM] VP2 --- V1[V] VP2 --- NP3[NP] NP2 --- N1[N] NP2 --- N2[N] NOM1 --- N3[N] N1 --- The[The] N2 --- knight[knight] V1 --- mounts[mounts] NP3 --- NP4[NP] NP3 --- NOM2[NOM] NP4 --- N4[N] NP4 --- N5[N] NOM2 --- N6[N] N4 --- his[his] N5 --- horse[horse] </pre>
<p>(3) no parse: error</p>	<p>(9)</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- DET1[DET] NP1 --- NOM1[NOM] VP2 --- V1[V] VP2 --- NP2[NP] NP2 --- NOM2[NOM] DET1 --- DET2[DET] DET1 --- N1[N] NOM1 --- N2[N] V1 --- rides[rides] NP2 --- N3[N] NP2 --- N4[N] DET2 --- The[The] N1 --- knight[knight] N3 --- his[his] N4 --- horse[horse] </pre>
<p>(4) *partial</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- DET1[DET] NP1 --- NOM1[NOM] VP2 --- VP3[VP] VP2 --- PP[PP] DET1 --- DET2[DET] DET1 --- N1[N] NOM1 --- N2[N] VP3 --- V1[V] VP3 --- NP2[NP] DET2 --- DET3[DET] DET2 --- N3[N] N1 --- hart[hart] V1 --- runs[runs] PP --- P1[P] PP --- NP3[NP] DET3 --- DET4[DET] DET3 --- N4[N] DET4 --- next[next] NP3 --- DET5[DET] NP3 --- NOM2[NOM] DET5 --- DET6[DET] DET5 --- N5[N] DET6 --- the[the] DET7[DET] --- Table[Table] </pre>	<p>(10)</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- DET1[DET] NP1 --- NOM1[NOM] VP2 --- V1[V] VP2 --- NP2[NP] DET1 --- DET2[DET] DET1 --- N1[N] NOM1 --- N2[N] V1 --- carries[carries] NP2 --- DET3[DET] NP2 --- NOM2[NOM] DET2 --- DET4[DET] DET2 --- N3[N] DET3 --- the[the] DET4 --- braket[braket] </pre>
<p>(5) no parses found</p>	
<p>(6)</p> <pre> graph TD VP1[VP] --- NP1[NP] VP1 --- VP2[VP] NP1 --- DET1[DET] NP1 --- NOM1[NOM] VP2 --- V1[V] DET1 --- DET2[DET] DET1 --- N1[N] NOM1 --- N2[N] V1 --- arises[arises] DET2 --- A[A] DET3[DET] --- knight[knight] </pre>	

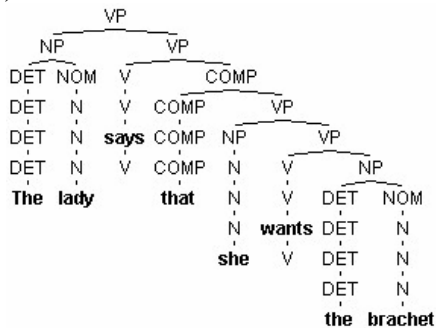
(11)



(12)



(13)



(14) no parse: error

(15) no parses found

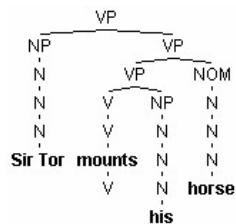
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(20)



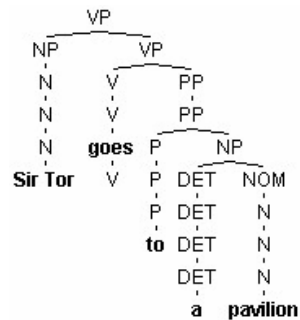
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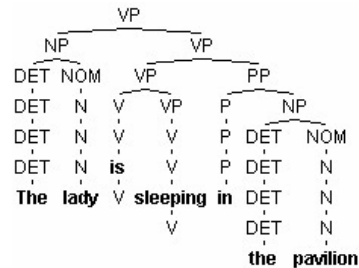
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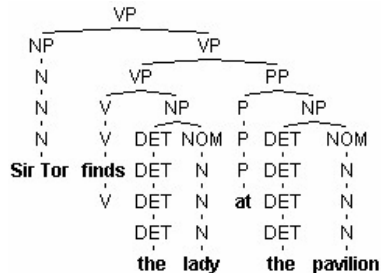
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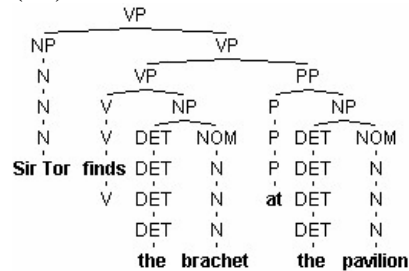
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(27)

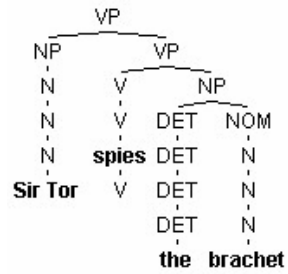


(28)

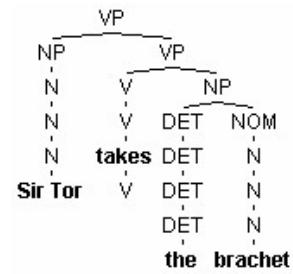


(29) no parse: error

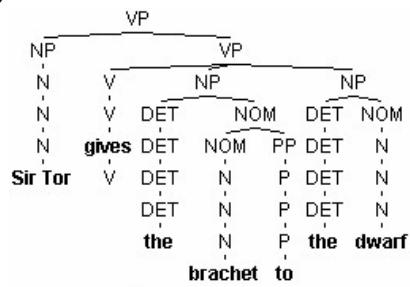
(30)



(31)



(32)



(33) no parses found

(34) no parse: error

(35) no parses found

(36) no parse: error

(37) no parse: error

Appendix C

Additions to ergo grammar:

lexicon.tdl:

```
brachet_n1 := n_intr_le &
  [ STEM < "brachet" >,
    SYNSEM.LOCAL.KEYS.KEY _brachet_rel ].

buttock_n1 := n_ppof_le &
  [ STEM < "buttock" >,
    SYNSEM.LOCAL.KEYS.KEY _buttock_rel ].

damosel_n1 := n_ppof_le &
  [ STEM < "damosel" >,
    SYNSEM.LOCAL.KEYS.KEY _damosel_rel ].

elder_n1 := n_intr_le &
  [ STEM < "elder" >,
    SYNSEM.LOCAL.KEYS.KEY _elder_n_rel ].

knight_n1 := n_intr_le &
  [ STEM < "knight" >,
    SYNSEM.LOCAL.KEYS.KEY _knight_n_rel ].

hart_n1 := n_intr_le &
  [ STEM < "hart" >,
    SYNSEM.LOCAL.KEYS.KEY _hart_rel ].

hound_n1 := n_intr_le &
  [ STEM < "hound" >,
    SYNSEM.LOCAL.KEYS.KEY _hound_rel ].

king := n_title_le &
  [ STEM < "king" >,
    SYNSEM.LOCAL.KEYS.KEY title_rel &
      [ CONST_VALUE 'King' ] ].

Gawain_n1 := n_proper_le &
  [ STEM < "gawain" >,
    SYNSEM.LOCAL.KEYS.KEY.CONST_VALUE 'Gawain' ].

Merlin_n1 := n_proper_le &
  [ STEM < "merlin" >,
    SYNSEM.LOCAL.KEYS.KEY.CONST_VALUE 'Merlin' ].

or_else_conj_1 := conj_complex_or_le &
  [ STEM < "or", "else" > ].

round_isect := adj_intrans_le &
```

```
[ STEM < "round" >,  
  SYNSEM.LOCAL.KEYS.KEY _round_rel ].
```

```
slay_v13 := v_np*_trans_le &  
  [ STEM < "slay" >,  
    SYNSEM.LOCAL.KEYS.KEY _slay_rel ].
```

```
spy_v1 := v_np_trans_le &  
  [ STEM < "spy" >,  
    SYNSEM.LOCAL.KEYS.KEY _spy_rel ].
```

```
white_isect := adj_intrans_le &  
  [ STEM < "white" >,  
    SYNSEM.LOCAL.KEYS.KEY _white_rel ].
```

semrels.tdl:

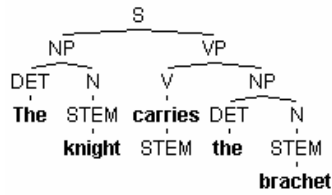
```
_round_rel :< adj_rel.  
_white_rel :< adj_rel.  
_brachet_rel :< reg_nom_rel.  
_buttock_rel :< diadic_noarg_nom_rel.  
_damosel_rel :< diadic_noarg_nom_rel.  
_elder_n_rel :< reg_nom_rel.  
_knight_n_rel :< reg_nom_rel.  
_hart_rel :< reg_nom_rel.  
_hound_rel :< reg_nom_rel.  
_slay_rel :< arg13_rel.  
_spy_rel :< arg13_rel.
```

Appendix D

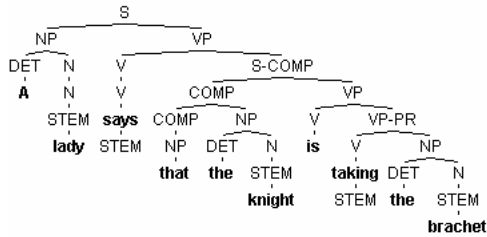
Outputs of modified ergo grammar for each sentence (1-37)

<p>(1)</p>	<p>(5)</p>
<p>(2)</p>	<p>(6)</p>
<p>(3)</p>	<p>(7)</p>
<p>(4)</p>	<p>(8)</p>
	<p>(9)</p>

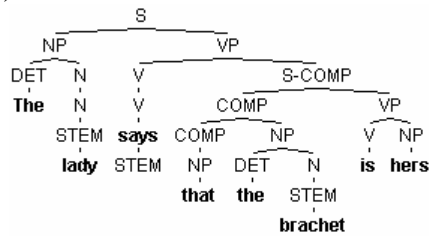
(10)



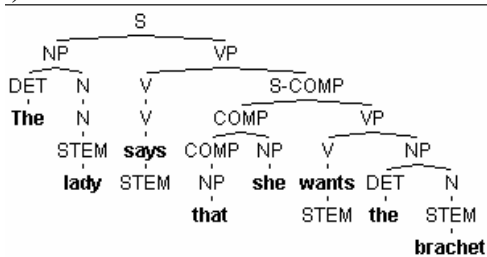
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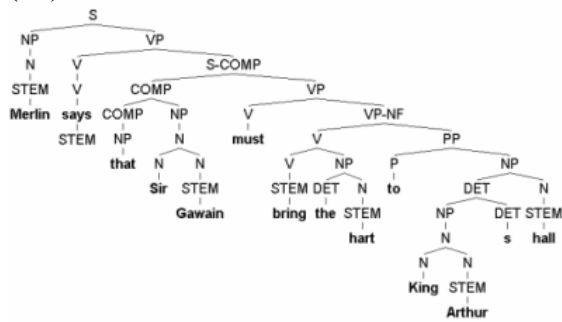
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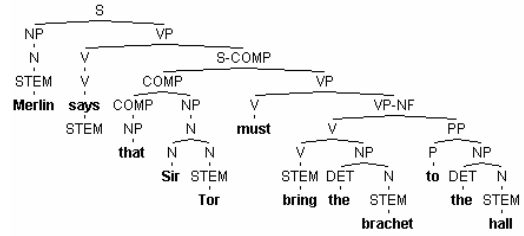
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(14)



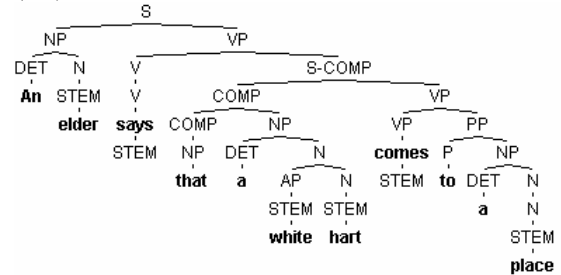
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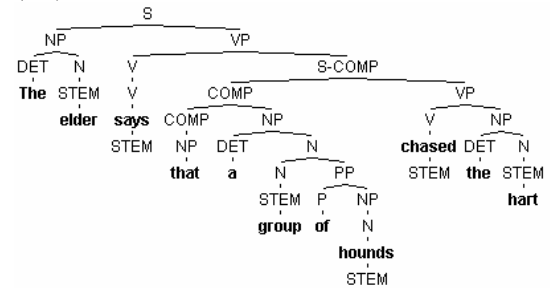
(16) error *maximum-number-of-edges*

note: *maximum-number-of-edges* was set to 16000.

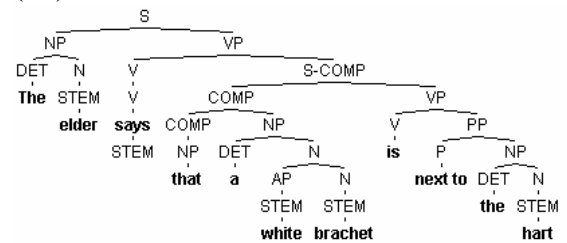
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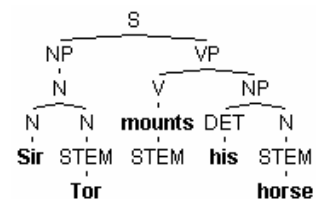
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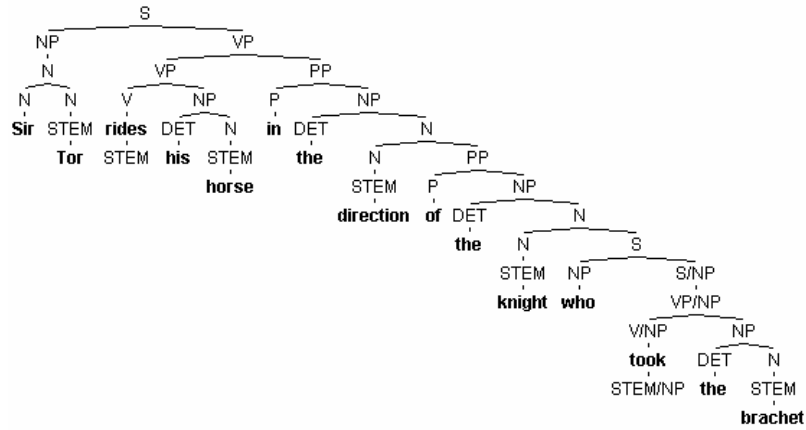
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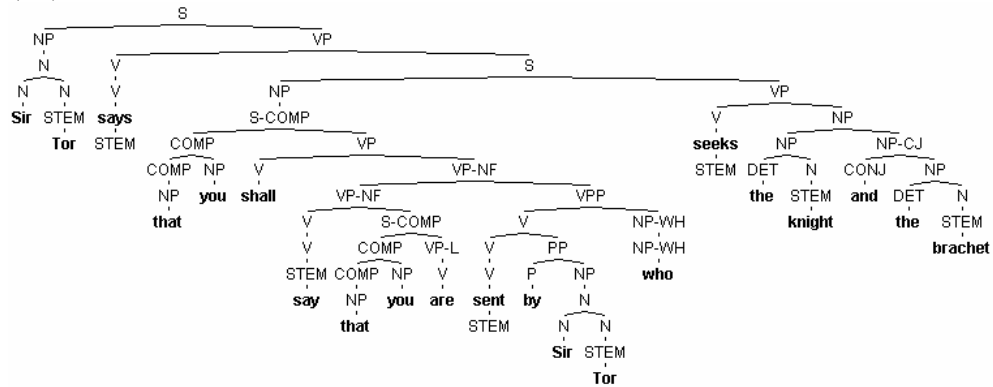
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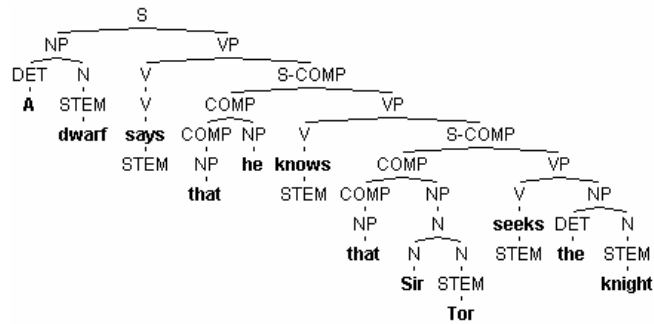
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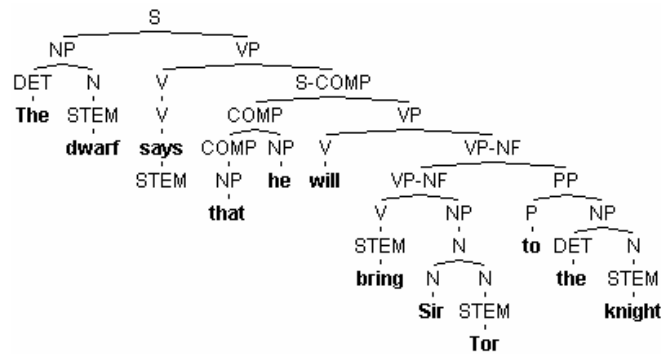
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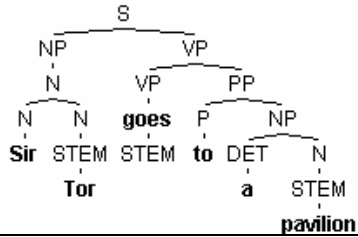
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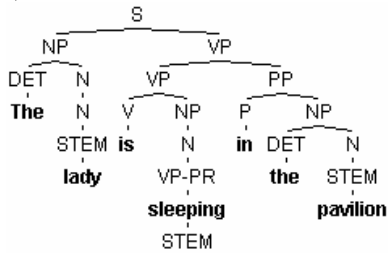
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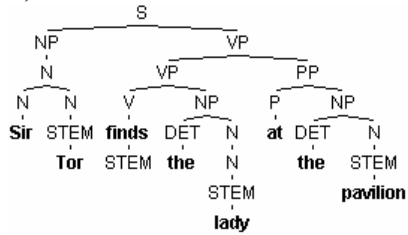
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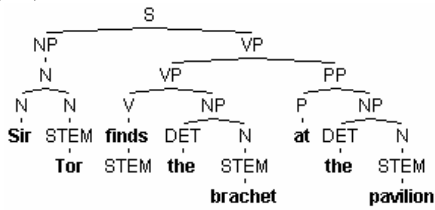
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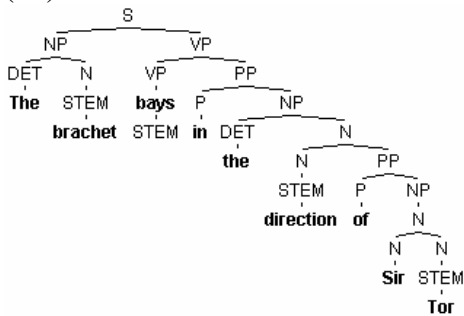
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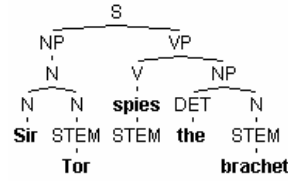
(28)



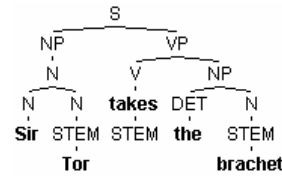
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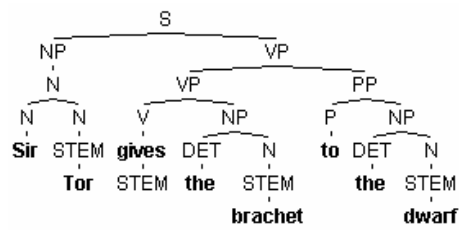
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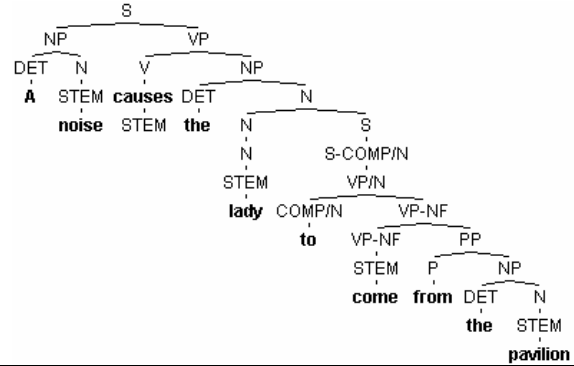
(31)



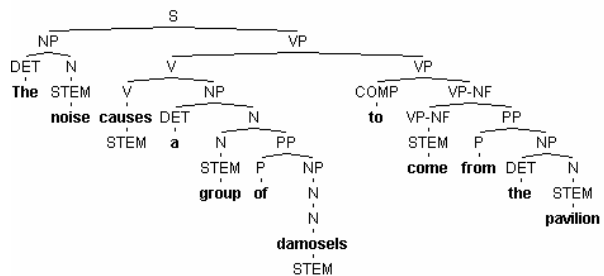
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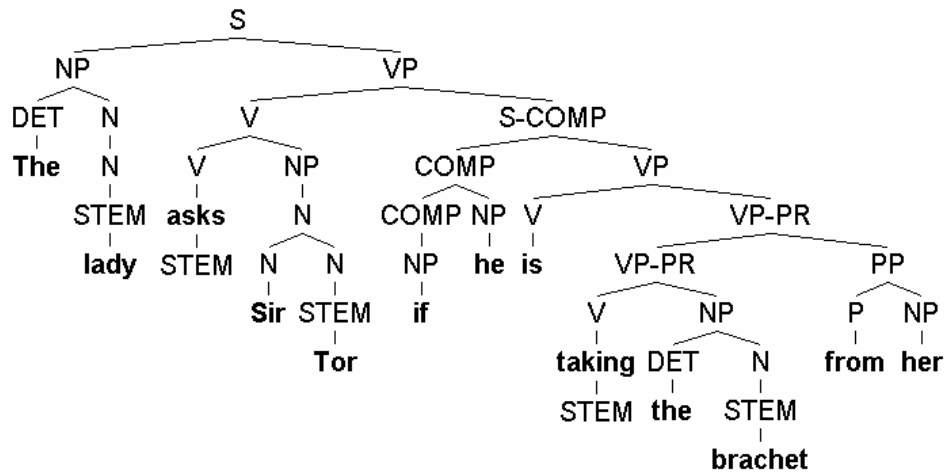
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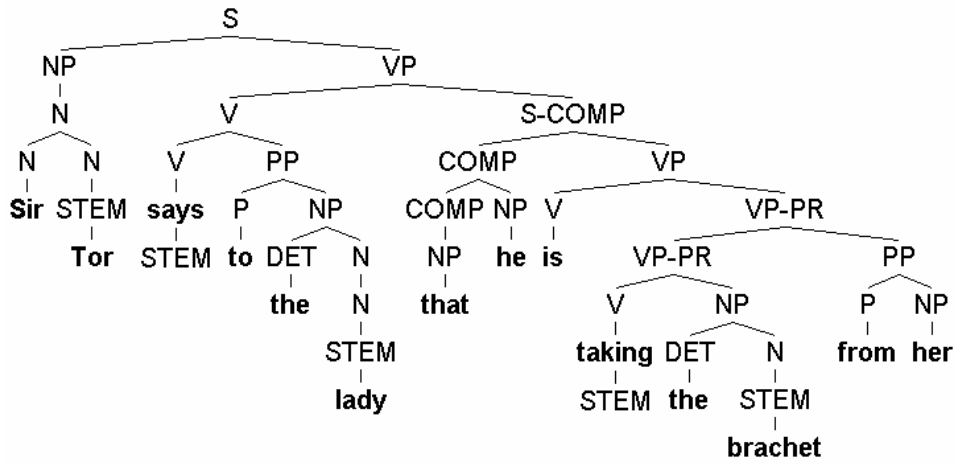
(34)



(35)



(36)



(37)

