

Algorithm for NLP: Homework 5

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Due on Dec 5, 2013

Bowen Low blow

Answer:

Answer:

1. 2.1 CCG Syntactic analysis

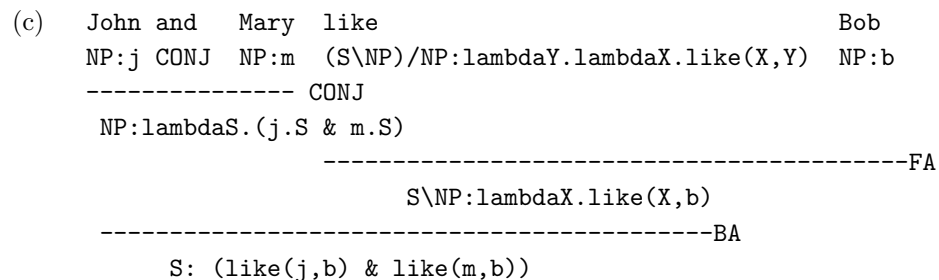
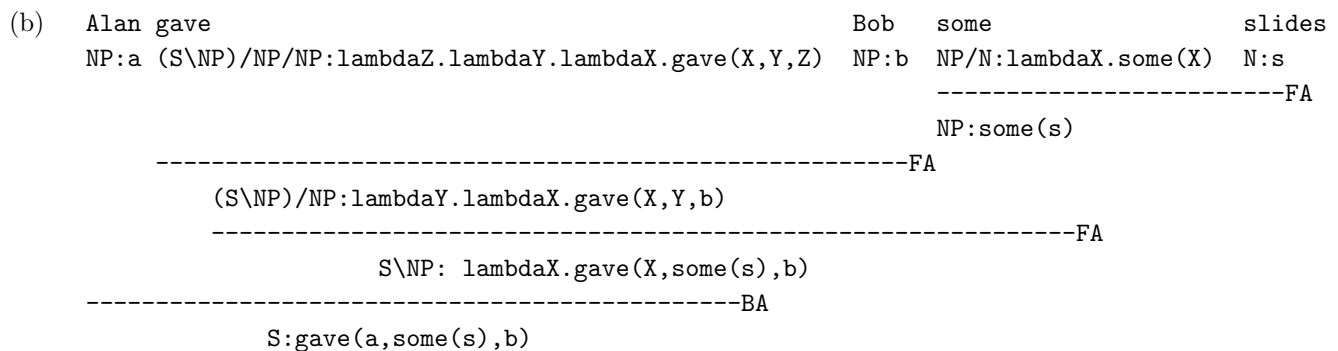
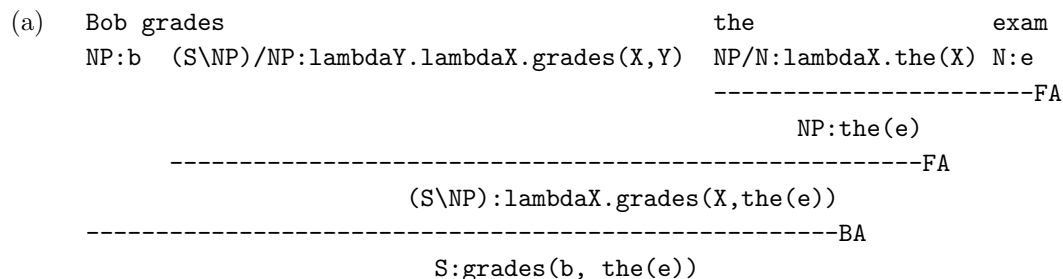
- (a) John and Mary like Bob
NP CONJ NP (S\NP)/NP NP
----- CONJ
NP
-----FA
S\NP
----- BA
S
- (b) Alan gave Bob some slides
NP (S\NP)/NP/NP NP NP/N N
-----FA
NP
-----FA
(S\NP)/NP
-----FA
S\NP
-----BA
S
- (c) John likes Mary but Mary dislikes John
NP (S\NP)/NP NP CONJ NP (S\NP)/NP/NP NP
-----FA -----FA
(S\NP) (S\NP)



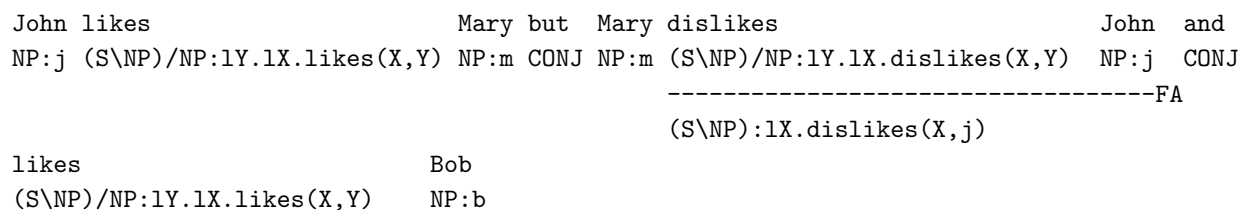
(d)

(e)

2. 2.2 CCG Semantic Analysis



(d) lambda is written as l here.



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-----FA
(S\NP):lX.likes(X,b)

NP:j (S\NP):lY.lX.likes(X,Y) NP:m CONJ
NP:m (S\NP):lX.dislikes(X,j) CONJ (S\NP):lX.likes(X,b)
-----FA
(S\NP):lS.(lX.dislikes(X,j).S & lX.likes(X,b).S)
-----BA
S:(dislikes(m,j) & likes(m,b))

NP:j (S\NP):lY.lX.likes(X,Y) NP:m CONJ S:(dislikes(m,j) & likes(m,b))
-----FA
S\NP:lX.likes(X,m)
-----BA
S: likes(j,m)
-----CONJ
S:lS.(likes(j,m).S & (dislikes(m,j) & likes(m,b)).S)
S: (likes(j,m) & (dislikes(m,j) & likes(m,b)))

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3. 2.3 Categorical Unification Grammar

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he    : [cat:np num:sg]
I     : [cat:np num:pl]
you   : [cat:np num:pl]
like  : ([cat:s]\[cat:np num:pl])/[cat:np]
likes : ([cat:s]\[cat:np num:sg])/[cat:np]
walk  : [cat:s]/[cat:np num:pl]
walks : [cat:s]/[cat:np num:sg]
walked: [cat:s]/[cat:np num:!X]
movie : [cat:n num:sg]
movies: [cat:n num:pl]
boy   : [cat:n num:sg]
boys  : [cat:n num:pl]
the   : [cat:np num:!X]/[cat:n num:!X]

```

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)

Acknowledgement: