

Analysis/Generation Knowledge Sources

ANALYSIS GRAMMAR

;;;-----

;;; Start symbol

;;;-----

(<start> <==> (<S>)
 ((x0 = x1)))

;;;-----

;;; Sentence Rules

;;;-----

(<S> <==> (<NP> <VP>)
 ((x1 case) = nominative)
 ((x1 agreement) = (x2 agreement))
 ((x0 subj) = x1)
 (x0 = x2)))

;;;-----

;;; NP Rules

;;;-----

(<NP> <==> (<DET> <N>)
 ((x1 number) = (x2 number))
 ((x0 definiteness) = (x1 definiteness))
 (x0 = x2)))

(<NP> <==> (<N>)
((x0 = x1)))

;;;-----
;;; VP Rules
;;;-----

(<VP> <==> (<V>)
((x0 = x1)))

;;;
;;;-----
;;; Function Words
;;;-----

(<DET> <--> (a)
(((x0 root) = a)
((x0 number) = sg)
((x0 definiteness) = -)))

;;;-----
;;; Nouns
;;;-----

(<N> <--> (b i r d)
(((x0 root) = bird)
((x0 number) = sg)
((x0 agreement) = 3sg)))

(<N> <--> (b i r d s)
(((x0 root) = bird)
((x0 number) = pl)
((x0 agreement) = pl)))

```
;;;-----  
;;; Verbs  
;;;-----
```

```
(<V> <--> (f l i e s)  
  (((x0 root) = fly)  
   ((x0 agreement) = 3sg)  
   ((x0 form) = present)))
```

```
(<V> <--> (f l y)  
  (((x0 root) = fly)  
   ((x0 agreement) = pl)  
   ((x0 form) = present)))
```

Analysis/Generation Knowledge Sources

GENERATION GRAMMAR

;;;-----

;;; Start symbol

;;;-----

(<start> ==> (<S>
 ((x1 = x0)))

;;;-----

;;; Sentence Rules

;;;-----

(<S> ==> (<NP> <VP>
 ((x1 == (x0 subj))
 (x2 = x0)
 ((x1 case) = nominative)
 ((x1 agreement) = (x2 agreement))))

;;;-----

;;; NP Rules

;;;-----

(<NP> ==> (<DET> <N>
 ((x2 = x0)
 ((x1 number) = (x2 number))
 ((x1 definiteness) = (x0 definiteness))
))

```
(<NP> ==> (<N>)
  ((x1 = x0)
   ((x0 definiteness) = *UNDEFINED*)))
```

```
;;;-----
;;; VP Rules
;;;-----
```

```
(<VP> ==> (<V>)
  ((x1 = x0)))
```

```
;;;-----
;;; Function Words
;;;-----
```

```
(<DET> --> (a)
  (((x0 root) = a)
   ((x0 number) =c sg)
   ((x0 definiteness) =c -)))
```

```
;;;-----
;;; Nouns
;;;-----
```

```
(<N> --> (b i r d)
  (((x0 root) =c bird)
   ((x0 number) =c sg)
   ((x0 agreement) =c 3sg)))
```

```
(<N> --> (b i r d s)
  (((x0 root) =c bird)
   ((x0 number) =c pl)
   ((x0 agreement) =c pl)))
```

```
;;;-----  
;;; Verbs  
;;;-----
```

```
(<V> --> (f l i e s)  
          (((x0 root) =c fly)  
            ((x0 agreement) =c 3sg)  
            ((x0 form) =c present)))
```

```
(<V> --> (f l y)  
          (((x0 root) =c fly)  
            ((x0 agreement) =c pl)  
            ((x0 form) =c present)))
```

```
> (tr "a bird flies")
```

```
>a bird flies
```

```
1 (1 distinct) F-structure created,  
using 1.74763 seconds of real time.
```

```
;**** F-structure 1 ****
```

```
((FORM PRESENT) (AGREEMENT 3SG) (ROOT FLY)  
(SUBJ  
  ((AGREEMENT 3SG) (CASE NOMINATIVE)  
  (DEFINITENESS -) (NUMBER SG)  
  (ROOT BIRD))))
```

```
GenKit> <START> called  
GenKit>   <S> called  
GenKit>   <NP> called  
GenKit>     <DET> called  
GenKit>     <DET> returns "A"  
GenKit>     <N> called  
GenKit>     <N> returns "BIRD"  
GenKit>     <NP> returns "A BIRD"  
GenKit>     <VP> called  
GenKit>       <V> called  
GenKit>       <V> returns "FLIES"  
GenKit>     <VP> returns "FLIES"  
GenKit>   <S> returns "A BIRD FLIES"  
GenKit> <START> returns "A BIRD FLIES"  
"A BIRD FLIES"
```

```
> (translate "a bird flew")
```

```
>a bird flew
```

```
1 (1) ambiguity found and took 0.427894  
seconds of real time
```

```
;**** ambiguity 1 ***
```

```
((SUBJ  
  ((AGREEMENT 3SG) (CASE NOMINATIVE)  
    (DEFINITENESS -)  
    (NUMBER SG)  
    (ROOT BIRD)))  
(FORM PAST)  
(ROOT FLY))
```

```

GenKit> <START> called
GenKit>   <S> called
GenKit>     <NP> called
GenKit>       <N> called
GenKit>         Rule 1 for <N> returns "TORI"
GenKit>       <N> returns "TORI"
GenKit>     <P> called
GenKit>       Rule 1 for <P> returns "GA"
GenKit>     <P> returns "GA"
GenKit>     Rule 1 for <NP> returns "TORI GA"
GenKit>   <NP> returns "TORI GA"
GenKit>   <VP> called
GenKit>     <V> called
GenKit>       Rule 2 for <V> returns "TONDA"
GenKit>     <V> returns "TONDA"
GenKit>     Rule 1 for <VP> returns "TONDA"
GenKit>   <VP> returns "TONDA"
GenKit>     Rule 1 for <S> returns "TORI GA TONDA"
GenKit>   <S> returns "TORI GA TONDA"
GenKit>   Rule 1 for <START> returns
                                     "TORI GA TONDA"
GenKit> <START> returns "TORI GA TONDA"
"TORI GA TONDA"

```