Assignment 3

Chris Potts, Ling 130a/230a: Introduction to semantics and pragmatics, Winter 2024

Distributed Jan 30; due Feb 6

1 Composition [5 points]

For each of the top (root) nodes in the following trees, provide (i) the name of the rule you used to derive that meaning from its constituent parts, according to the handout 'Semantic composition', and (ii) the meaning itself after all the allowable substitutions from function applications. Thus, for example, given the tree on the left, either answer at right would be complete and accurate:
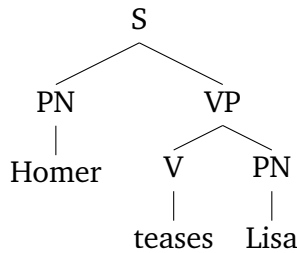
```
        S
      /   \
    PN     VP
    |      |
  Homer    V
           |
      introspects
```
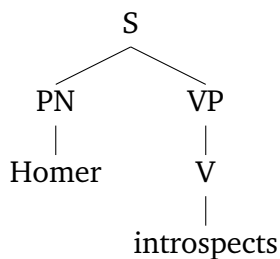
Rule (S) derives T if $[\![Homer]\!] \in [\![introspects]\!]$, else F

Rule (S) derives T if $[\![Homer]\!] \in \left\{ \begin{array}{c} \includegraphics , \includegraphics \end{array} \right\}$, else F

There are typically many equivalent ways of specifying a given meaning. We care only that you specify the correct meaning. High-quality Simpsons drawing are always appreciated but certainly not required.
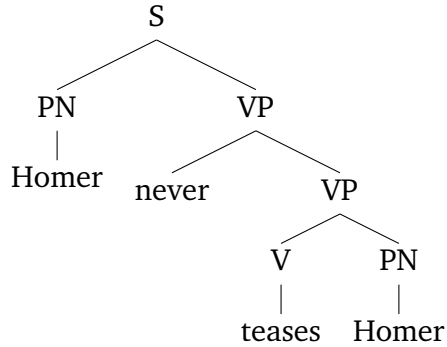
1.1
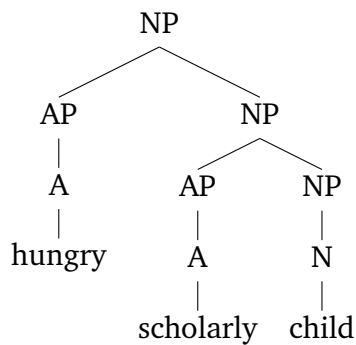
```
            S
          /   \
        PN      VP
        |      /  \
      Homer   V    PN
              |    |
           teases Lisa
```
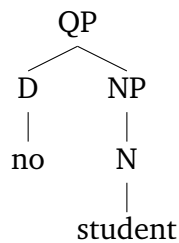
1.2

```
          VP
         /  \
        V    PN
        |    |
     admires Homer
```

1.3

```
                    S
          ┌─────────┴─────────┐
         PN                   VP
          │          ┌────────┴────────┐
        Homer      never              VP
                              ┌────────┴────────┐
                              V                 PN
                              │                 │
                            teases            Homer
```

1.4

```
                         NP
              ┌──────────┴──────────┐
             AP                     NP
              │            ┌─────────┴─────────┐
              A           AP                   NP
              │            │                    │
           hungry         A                    N
                          │                    │
                       scholarly             child
```

1.5

```
                    QP
              ┌─────┴─────┐
              D           NP
              │           │
             no           N
                          │
                       student
```
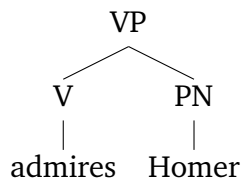
2 A new transitive V   [2 points]

Suppose we extend our grammar with the Transitive V *hugs*, defined as

$$[\![hugs]\!] = \lambda y \,(U - \{y\})$$

What are the values of the following?

(a) $[\![hugs]\!]\left(\vphantom{X} \right)$

(b)   T if ⬚ $\in [\![hugs]\!]\left(\vphantom{X} \right)$, else F

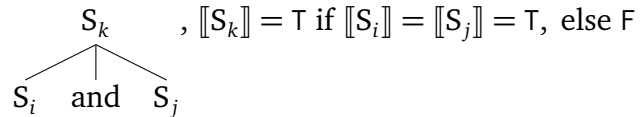# 3   Coordinating VPs   [2 points]

Let's extend our semantic grammar with two new rules for handling coordination. Rule VC is for 'Verb-phrase Coordination', and Rule SC is for 'Sentential Coordination':

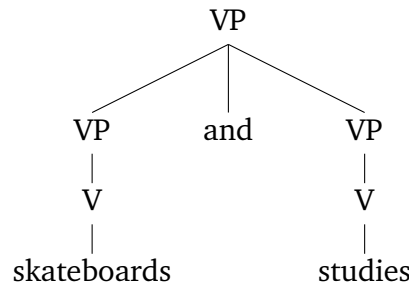(VC)   Given a syntactic structure

$$\begin{array}{c} \text{VP}_k \\ \diagup\!\mid\!\diagdown \\ \text{VP}_i \quad \text{and} \quad \text{VP}_j \end{array} \quad , \quad [\![\text{VP}_k]\!] = [\![\text{VP}_i]\!] \cap [\![\text{VP}_j]\!]$$

(SC)   Given a syntactic structure

$$\begin{array}{c} \text{S}_k \\ \diagup\!\mid\!\diagdown \\ \text{S}_i \quad \text{and} \quad \text{S}_j \end{array} \quad , \quad [\![\text{S}_k]\!] = \mathsf{T} \text{ if } [\![\text{S}_i]\!] = [\![\text{S}_j]\!] = \mathsf{T}, \text{ else } \mathsf{F}$$
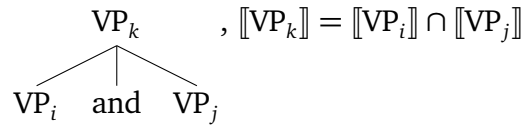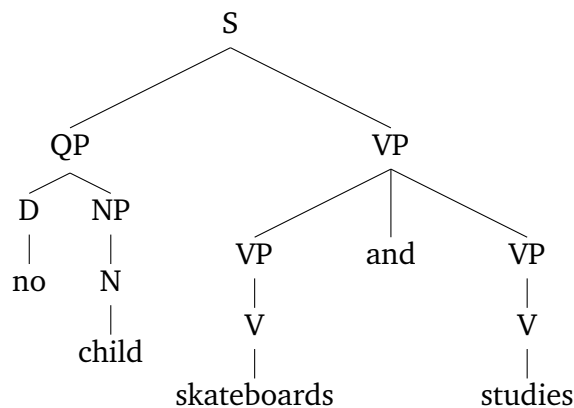
Using the above meanings, compositionally derive the meanings for the following trees. The instructions here are the same as for question 1: for each tree, you need only report (i) the name of the rule you used to derive the meaning of the root node, and (ii) the meaning of the root node itself after all the allowable substitutions from function applications.

3.1

```
                    VP
                  /  |  \
               VP   and   VP
               |          |
               V          V
           skateboards  studies
```

3.2

```
                       S
                    /     \
                  QP       VP
                 /  \     /  |  \
                D   NP  VP  and  VP
                |   |   |        |
               no   N   V        V
                   |  skateboards studies
                 child
```

There is a third tree on the next page.

3.3

```
                              S
                 _____|_____
                S            and            S
            ____|____                   ____|____
          QP        VP                QP        VP
        __|__        |              __|__        |
       D    NP       V             D    NP       V
       |     |       |             |     |       |
      no     N  skateboards       no     N    studies
             |                           |
           child                       child
```