Exercises due on: Tuesday, July 2, 10 AM (before class)

Semantic Theory 2019: Exercise sheet 8

Note: You can either do this exercise on paper, or you can use `DFS-TOOLS` (see `https://github.com/hbrouwer/dfs-tools`). In the latter case, you will have to submit a world-specification file, as well as a list of commands that you used to obtain the answers to the questions.

Assume that we define a microworld in which there are three people (*jess*, *nick* and *winston*), two properties (*read* and *sleep*), and one two-place predicate (*tease*).

1) Describe the set of all atomic propositions that can be defined for this microworld.

2) Create a toy model space $\mathcal{S}_{\mathcal{M}\times\mathcal{P}}$ (with at most twenty observations) that at least satisfies the following world knowledge constraints:

   - One cannot read and sleep at the same time
   - Nick likes sleeping over reading
   - Jess likes reading over sleeping
   - Winston teases Nick more often than he teases Jess
   - If Winston teases somebody, Jess does not tease the same person

3) Use the appropriate probability measures to show that the above constraints hold in your model space. Does your model space contain any other interesting inferences?

4) Based on you model space from (2), provide the semantics and corresponding meaning vectors for the following sentences:

   a. Winston teases Nick.
   b. Nick sleeps and Jess reads.
   c. Everyone makes fun of Jess.
   d. Winston teases Nick or Jess.
   e. A boy is sleeping.

5) Use the comprehension score to determine how much the atomic proposition for "Nick sleeps" is understood to be the case from "A boy is sleeping".