

### Questions on the Semantics of Modals

- (1) Using one of the semantic analyses developed in class, prove that the following two sentences are logically equivalent.
  - a. John must be in NYC.
  - b. It's not the case that John may not be in NYC.
- (2) Please label, as best you can, the 'readings' that the modals receive in the sentences below. If you encounter any 'interesting difficulties' at all, please make note of them.
  - a. In order to pass this course, you **have to** make higher than an 86 on the final.
  - b. Since the first two movies made total bank, a third Batman movie **must** be in development.
  - c. On his next turn, Dave **can** win the game by moving his rook.
  - d. City law requires that all dog owners possess a license for their dogs. Joe owns a dog. Therefore, Joe **must** possess a license for his dog.
- (3) Please show how the system developed in 'Part2' of our discussion can derive the truth conditions of the 'circumstantial reading' of the following sentence: John has to sneeze.
- (4) Consider the following claim:

*The pronoun 'BASE<sub>i</sub>' can have as its value any conceivable function from worlds to sets of propositions.*

In your opinion, is the claim above true? Why or why not?
- (5) The semantic system developed in 'Part2' of our discussion makes critical use of the (phonologically null) pronoun 'BASE'. However, we needn't actually appeal to a *null pronoun* to adopt the general approach to the semantics of modals put forth in 'Part2'.

Please show how we can alter the analysis from 'Part2' so that it no longer needs to appeal to the null pronoun 'BASE'. Here's what you need to get started:

- Suppose that, in addition to the parameters 'w' and 'g', our semantic valuation function '[[ ]]' is also parameterized to a function 'f'.
- This additional function 'f' is a function from worlds to sets of propositions.
- The following would be lexical entries for 'votes' and 'him' in this system.

$$[[ \text{votes} ]]^{\text{w,g,f}} = \lambda x. x \text{ votes in } w. \quad [[ \text{him}_i ]]^{\text{w,g,f}} = g(i)$$

- **How would you write the lexical entries for the modals 'may' and 'must'?**

$$[[ \text{may} ]]^{\text{w,g,f}} = ??? \quad [[ \text{must} ]]^{\text{w,g,f}} = ???$$