For each of the following, write a normal English sentence that it could be a translation of. Assume that the predicates are named rationally, so that tall(x) is true of all and only tall individuals x. Try to use sentences that you could imagine actually saying (that is, like “John likes everyone” rather than like “For every x such that x is a person, John and x stand in a liking relation”). It’s ok if your English sentence is ambiguous, so long as one of its meanings is like the one described formally below.

(1) a. ∀x [ person(x) → crazy(x)]
   Not everyone is crazy.

b. ∃x [ ∃y [ person(x) ∧ truck(y) ∧ bought(x, y) ] ]
   Someone bought a truck.

c. ∀x [ child(x) → (∃y [ painting(y) ∧ admired(x, y) ] ∧ ∃y [ sandwich(y) ∧ ate(x, y) ])]
   Every child either admired a painting or ate a sandwich.

d. ∀x [ person(x) → eats(x) ] ∧ ∀x [ person(x) → hungry(x) ]
   If nobody eats, everyone is hungry.

For each of the two sentences below, indicate whether the place where a celebrity appears is an upward entailing or downward entailing environment, and briefly indicate how you arrived at your conclusion.

(2) I have never met a celebrity.
Downward entailing. Remains true if you replace the general with the specific; i.e. it would also be true that I have never met a tall celebrity. Also, any is allowed in this position: I have never met anyone.

(3) My sister met a celebrity.
Upward entailing. Remains true if you replace the specific with the general; i.e. it would also be true that My sister met a person. And, any is not allowed in this position: *My sister met anyone.

In (4) and (5) are two grammatical sentences about imaginary measures, flimen and sterg, measuring slurm (a mass noun). (4) and (5) were true in the early morning, but in a daring daylight robbery, exactly half of everything was stolen. Describe the remaining slurm on the shelf both in terms of flimen and sterg. Explain how you know this.

(4) John saw 4 flimen of slurm on the shelf.
(5) John saw 10 sterg slurm on the shelf.
After the robbery, there were 2 flimen of 10 sterg slurm on the shelf. We know that the measure of the remaining slurm is less than 4 flimen because in (4), the pseudopartitive was used, and the pseudopartitive is only allowed with a monotonic measure (one which will measure less on a subpart of the material being measured, and one which measures something with subparts). On the other hand, we know that the remaining slurm is still 10 sterg because slurm has subparts (that are slurm) since it is a mass noun, but yet the use of the compound in (5) tells us that the measure in terms of sterg is non-monotonic. Thus, the measure remains the same even for subparts of the slurm.

Suppose that Mary has just started her own business, and she’s the only employee. First: Only one interpretation of her secretary in (6) is true under this scenario, which is it (de dicto or de re)? Second: Describe a different scenario in which only the other interpretation would make (6) true.

(6) Mary dreamt that John had a business lunch with her secretary.

Under the given scenario, her secretary does not refer to anybody in the actual world. Thus, it must be the de dicto reading that makes (6) true: She dreamt that she had a secretary and that John had a business lunch with said secretary.

A scenario under which only the de re reading is true would be one in which Mary has a secretary in the actual world (say, Pat), and John had a business lunch with Pat. In order to make the de dicto reading false, though, it must also be the case that in Mary’s dream, Pat was not her secretary—for example, Mary dreamt that she had no secretary and that John had a business lunch with Pat.

Accepting (7) as a true statement about the way things are, does (8) imply (9)? Does (9) imply (8)?

(7) Every dog is carnivorous.
(8) Fido is a dog.
(9) Fido is carnivorous.

(8) implies (9), but (9) does not imply (8).
For each sentence in (10), indicate what type of event it describes (state, activity, accomplishment, or achievement).

(10)  
<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>a.</td>
<td>John tripped over a branch.</td>
</tr>
<tr>
<td></td>
<td>achievement</td>
</tr>
<tr>
<td>b.</td>
<td>John tripped over branches.</td>
</tr>
<tr>
<td></td>
<td>activity</td>
</tr>
<tr>
<td>c.</td>
<td>Mary despises artichokes.</td>
</tr>
<tr>
<td></td>
<td>state</td>
</tr>
<tr>
<td>d.</td>
<td>John devoured his pudding.</td>
</tr>
<tr>
<td></td>
<td>accomplishment</td>
</tr>
<tr>
<td>e.</td>
<td>John devoured pudding.</td>
</tr>
<tr>
<td></td>
<td>activity</td>
</tr>
</tbody>
</table>

The adverbial phrase *a little* sounds fine in (11a–d) and not in (11e–f). Based on these facts, identify a single criterion that distinguishes the kinds of events that *a little* is compatible with from those that it isn’t (that is, don’t just name types of events that *a little* is compatible with, but indicate what they have in common that differentiates them from other types of events with which *a little* is incompatible).

(11)  
<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>a.</td>
<td>Mary swam a little.</td>
</tr>
<tr>
<td>b.</td>
<td>Mary drove her car a little.</td>
</tr>
<tr>
<td>c.</td>
<td>Mary is a little crazy.</td>
</tr>
<tr>
<td>d.</td>
<td>Mary likes John a little.</td>
</tr>
<tr>
<td>e.</td>
<td>#Mary drove her car to New York a little.</td>
</tr>
<tr>
<td>f.</td>
<td>#Mary swam the English Channel a little.</td>
</tr>
<tr>
<td>g.</td>
<td>#Mary discovered a quarter a little.</td>
</tr>
</tbody>
</table>

*A little* seems to work with activities (11a–b) and states (11c–d) but not with accomplishments (11e–f) or achievements (11g). What activities and states have in common is that they lack a specified endpoint, accomplishments and achievements both have an endpoint. So *a little* is possible when there is no specified endpoint to the event, when the event is not “delimited.”
The sentence in (12) is ambiguous in (at least) the three ways indicated by the followup sentences in (12a–c). For each of the readings, name the modal base being used for that interpretation, describe the contents of the modal base, and provide a paraphrase of the sentence that does not use a modal.

(12) The lion must sleep tonight.

a. All lions always sleep nightly.
   Root modal base. This modal base contains all possible worlds that are consistent with the facts of the actual world. Paraphrase: “The lion will sleep tonight.” Or, “In all situations consistent with the facts, the lion sleeps tonight.”

b. I see that they’ve prepared a bed for it.
   Epistemic modal base. The modal base contains all possible worlds that are consistent with what I know about the facts of the actual world. The fact that they’ve prepared a bed for it suggests that the lion will sleep tonight. Paraphrase: “Given what I know, I conclude that the lion sleeps tonight” or something along those lines.

c. It’s got a big day tomorrow.
   Deontic modal base. The modal base contains all possible worlds that are consistent with a standard of propriety. The lion should sleep tonight, in other words. Paraphrase: “If things go according to the standards of propriety, the lion will sleep tonight.”

For questions like (13), we have represented it as a set of propositions. If we assume that the only individuals under consideration for having been bought by Mary are coffee, milk, and vodka, what are the propositions in the set?

(13) What did Mary buy?

The propositions are:
(that) Mary bought coffee.
(that) Mary bought milk.
(that) Mary bought vodka.

Write the characteristic function for the set of numbers less than 5 ( {0, 1, 2, 3, 4}) in lambda notation. Assume that this function is only applied to natural numbers (integers greater than or equal to zero: 0, 1, 2, 3, 4, 5, 6, …). That is, this is a function that takes a natural number as its argument. You can assume that for a natural number \( n \), \( n < 5 \) is true if and only if \( n \) is less than 5.

\[ n \ [ n < 5 ] \]
Suppose John called from Europe and asked Mary to tape a bunch of TV shows during May sweeps. The only store Mary ever buys anything from carries videotapes, but only 6-hour tapes (and John knows this). John said he’d email the details, but Mary wanted to know how many blank videotapes she needed to buy for the project. John tells her she needs 4 videotapes. Explain why Mary concludes that John wants her to tape no more than 24 hours of television, having assumed that John was responding cooperatively according to Grice’s maxims.

If John needs 4 videotapes, then John needs 3 videotapes, and John needs 2 videotapes, etc. So, if John said he needed 5 videotapes, that would have been a stronger, more informative statement to make. John did not make this statement, even though it would be more informative, so assuming he is acting cooperatively, he refrained from making this more informative statement because he does not know it to be true. Since he is in a good position to know what is and isn’t true with respect to his videotape needs, Mary can assume that it is false that John needs 5 videotapes—that he needs 4 and no more. Since these are 6-hour tapes, 4 videotapes can hold 24 hours of television, and so John must be seeking to have her tape no more than that.