LING4400: Problem Set 4

Due via Carmen dropbox at 11:59 PM 10/31.

1. [2 pts.] For the following logical form (in which no predicates use event variables):
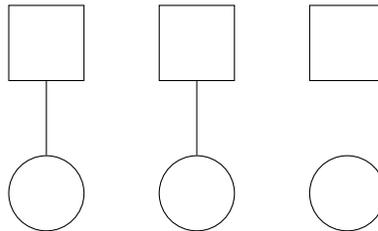
   Given a world M of Shape entities (where Triangle and Square have their usual meanings and NextTo is **True** only for immediate neighbors in the lineup as drawn):

   circle the shapes above that are **True** in the **denotation** of the following lambda calculus expression:

   $$[\![\lambda_{x:e} \text{ Triangle } x \wedge \text{ExactlyTwo } (\lambda_{y:e} \text{ Square } y) \ (\lambda_{y:e} \text{ NextTo } y \ x)]\!]^M$$

2. Given the world M depicted below:

   which of the following are **True**:

   (a) [1 pt.] $[\![\text{ExactlyTwo } (\lambda_{x:e} \text{ Circle } x) \ (\lambda_{x:e} \text{ ExactlyOne } (\lambda_{y:e} \text{ Square } y) \ (\lambda_{y:e} \text{ Connected } y \ x))]\!]^M$

   (b) [1 pt.] $[\![\text{ExactlyTwo } (\lambda_{x:e} \text{ Circle } x) \ (\lambda_{x:e} \text{ ExactlyTwo } (\lambda_{y:e} \text{ Square } y) \ (\lambda_{y:e} \text{ Connected } y \ x))]\!]^M$

3. For the sentence:

   Most countries are coastal and contain two volcanoes.

   (a) [3 pts.] Draw a **translation tree with logical forms at each branch** for the sentence. Note that you may need to use more than one schematized function.

   (b) [3 pts.] Label the **rules** used at every branch in your translation tree with Forward Function Application or Backward Function Application (as defined in Lecture Notes 2).

4. For the sentence:

   Most tropical countries are coastal.

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(a) [3 pts.] Draw a **translation tree with logical forms at each branch** for the sentence.

(b) [3 pts.] Label the **rules** used at every branch in your translation tree with Forward Function Application (Lecture Notes 2), Backward Function Application (Lecture Notes 2), Forward Modification (Lecture Notes 11), Backward Modification (Lecture Notes 11), or Argument Reordering (Lecture Notes 11).

5. For the following logical form (in which no predicates use event variables):

$$\text{Most } (\lambda_{x:e} \text{ (Country } x) \wedge (\text{Two}_{\langle e,t\rangle} \text{ City Contain } x)) \text{ Coastal}$$

(a) [3 pts.] Translate the logical form into **English** using a modification.

(b) [3 pts.] Draw a **translation tree with logical forms at each branch** for your English sentence. Your tree should have the words of your English translation at the bottom and the above logical form at the top.

(c) [3 pts.] Label the **rules** used at every branch in your translation tree with Forward Function Application (Lecture Notes 2), Backward Function Application (Lecture Notes 2), Forward Modification (Lecture Notes 11), Backward Modification (Lecture Notes 11), or Argument Reordering (Lecture Notes 11).