LING4400: Problem Set 6
Due via Carmen dropbox at 11:59 PM 11/28.

1. [4 pts.] Which of the following are valid entailments?

   (a) *Etna erupts and Wolf erupts*, so *Wolf erupts*.

   (b) *If Etna erupts then Wolf erupts*, and *Wolf erupts* so *Etna erupts*.

   (c) *Fewer than three coastal volcanoes erupted*, so *Fewer than three volcanoes erupted*.

   (d) *No volcanoes erupted*, so *No coastal volcanoes erupted*.

2. [6 pts.] List all of the following that are true of the below quantifiers: left upward entailing, left downward entailing, right upward entailing, right downward entailing (you can select multiple, or none):

   (a) *less than half*

   (b) *less than half and more than none*

   (c) *an odd number of*

3. [6 pts.] Prove *Etna is a coastal volcano* entails *Etna is coastal* by:

   (a) Translating the first sentence into formal logic.

   (b) Translating the second sentence into formal logic.

   (c) Identifying an entailment rule from the lecture notes on entailment that holds over the two resulting logical forms, and explaining in a sentence how it applies.

4. [6 pts.] Draw a **translation tree** showing a translated **sequent** at each branch for the following sentence, with *each donkey* scoping **high**, using quantifier storage as defined in the lecture notes on quantifier storage:

   > *Some farmer does not own each donkey.*

5. [6 pts.] Draw a **translation tree** showing a translated **sequent** at each branch for the following sentence, with *no farmer* wanting to own specific **real** (de re) donkey in this world, using quantifier storage as defined in the lecture notes on quantifier storage and intensions as defined in the lecture notes on intensions:

   > *Kim wants no farmer to own a donkey.*

   Specifically, you can use the following definition of *wants*:

   $$\lambda_{p:\text{t}} \, \lambda_{x:\text{e}} \, \text{Want} \, (\text{Intension} \, p) \, x$$