LING4400: Problem Set 5

Due via Carmen dropbox at 11:59 PM 11/14.

1. For the sentence:

    Never did Etna erupt.

    (a) [3 pts.] Draw a **translation tree** for the sentence using entity Etna, predicate Erupt of type $\langle e, \langle e, t \rangle \rangle$ (taking an eventuality as one of its arguments), predicate Identity of type $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$, quantifier None, and translation rules as described in the Lecture Notes 2, 11, and 12.

    (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), Argument Reordering (Lecture Notes 11), Existential Closure (Lecture Notes 12), Nuclear Scope Closure (Lecture Notes 12).

2. For the sentence:

    After Wolf erupted twice, Etna erupted twice.

    (a) [3 pts.] Draw a **translation tree** for the sentence using entities Etna and Wolf, predicate Erupt of type $\langle e, \langle e, t \rangle \rangle$ (taking an eventuality as one of its arguments), predicate After of type $\langle e, \langle e, t \rangle \rangle$ (taking two eventualities as arguments), quantifier ExactlyTwo, and translation rules as described in the Lecture Notes 2, 11, and 12.

    (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), Argument Reordering (Lecture Notes 11), Existential Closure (Lecture Notes 12), Nuclear Scope Closure (Lecture Notes 12).

3. [6 pts.] Draw a **derivation tree** (showing types at each branch) for the following expression:

    Believe (Intension (Contain Spain Italy)) France

    using entities France, Spain and Italy, predicate Believe of type $\langle \langle s, t \rangle, \langle e, t \rangle \rangle$, and Contain of type $\langle e, \langle e, t \rangle \rangle$, and the Intension operator as defined in Lecture Notes 13.

4. [6 pts.] Draw a **translation tree** for the following sentence:

    France claims Spain wants to attack Italy.

    using entities France, Spain and Italy, an identity function for *to*, a predicate Attack of type $\langle e, \langle e, t \rangle \rangle$ for *attack*, and the following definition of *claim*:

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

and the following definition of *want*:

$$\lambda_{s:\langle e,t \rangle}\ \lambda_{x:e}\ \text{Want}\ (\text{Intension}\ (s\ x))\ x$$