Natural Language Processing ***Exercise 7***

Property modifiers

Property modifiers are functions of type $((o\iota)_{\tau\omega}(o\iota)_{\tau\omega})$; they associate a given root property with a new, modified property.

Here is the basic taxonomy of property modifiers.

Intersective. "If *a* is a *round* peg, then *a* is round and *a* is a peg".

$[[M_iP]_{wt}\ a] \models [M^*_{wt}\ a] \wedge [P_{wt}\ a]$.

$\forall w \forall t\ [[M_iP]_{wt} = [M^*_{wt} \cap P_{wt}]]$

Necessarily, i.e. in all worlds and times, the set of round pegs equals to the intersection of the sets of round objects and pegs.

Subsective. "If *a* is a *skilful* surgeon, then *a* is a surgeon."

$[[M_sP]_{wt}\ a] \models [P_{wt}\ a]$.

$\forall w \forall t\ [[M_sP]_{wt} \subseteq P_{wt}]$

Necessarily, i.e. in all worlds and times, the set of skillful surgeons is a subset of the set of surgeons.

Privative. "If *a* is a *forged* banknote, then *a* is not a banknote".

$[[M_pP]_{wt}\ a] \models \neg[P_{wt}\ a]$.

$\forall w \forall t\ [[[M_pP]_{wt} \cap P_{wt}] = \varnothing]$

Necessarily, i.e. in all worlds and times, the intersection of the set of forged banknotes and banknotes is empty.

Analyse the following arguments and decide (prove) which of them are valid:

a is a round peg.
A1 ----------
a is round and a is a peg.

Jumbo is a small elephant.
Mickey is a large mouse.
A2 ----------
Jumbo is small and Mickey is large

Small things are smaller than large things
Jumbo is small and Mickey is large

Jumbo is smaller than Mickey

Custom officers collected three forged passports
Custom officers collected five forged banknotes

A_3 ---

Custom officers collected eight forged things