Sorts & Types

Group 8

New Media in Teaching Semantics

Type Theory?

- In mathematics, logic, and computer science, type theory is any of the several formal systems that can serve as alternatives to naive set theory, or the study of such formalisms in general.
- Mathematical method applied to linguistics.
- The view that some category of abstract entities come in a hierarchy of levels, with an entity of one level applying to entities only of a lower level.

Types: Sentences, Predicates and Terms

The verb ‘to kiss’ is a two-place predicate

kiss' (Diana, Dodi)

kiss' (x,y)

Diana kisses Dodi

e = entity

Typ(Diana) = e

Typ(Dodi) = e

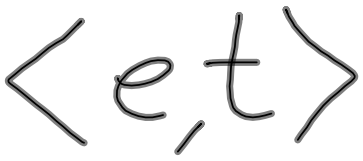
kiss'(x,y)

Typ: e,e

or

kiss' (Diana, Dodi)

Typ: e,e



t = truth value

TYPE(kiss'(Diana, Dodi)) = t

Assume (two-place predicate)

Assume(x,p)

Assume(Charles, that Diana kisses Dodi)

Charles assumes that Diana kisses Dodi

e t

Typ(assume'(Charles'(that Diana kisses Dodi) = t

t

Type(assume'(that Diana kisses Dodi)= t - e

Type(assume')= t- e- t

Types are binary and are made out of atleast 2 components

<e,t> one-place predicate

<e,<e,t>> two-place predicate

<e,<e,<e,t>> three-place predicate

one-place predicate <e,t>

"input" "output"

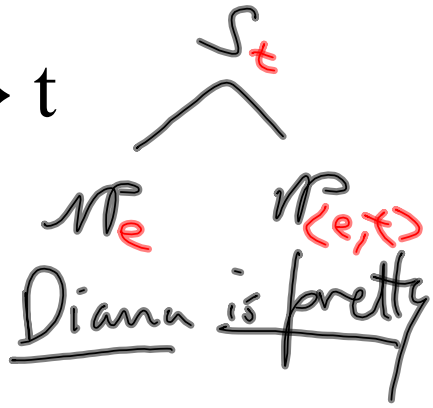
<e,t> + e ⟶ t

"e to t"

ispretty + Diana ⟶ t

t

e <e,t>



two-place predicate <e,<e,t>>

kiss Dodi Kiss'(Dodi)

<e,<e,t>> + e ⟶ <e,t>

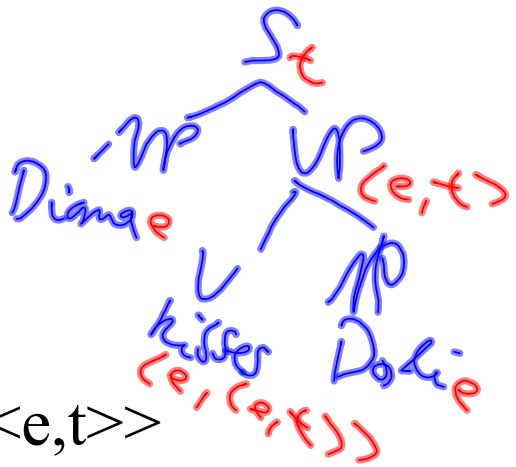
Diana

<e,t> + e ⟶ t

t

e<e,t>

e <e,<e,t>>



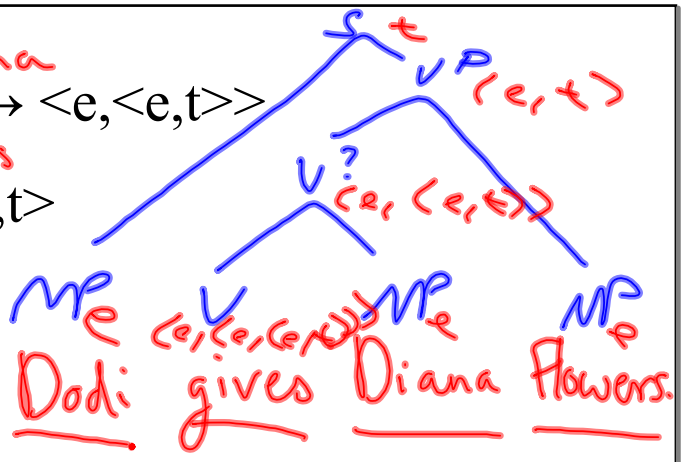
give Diana

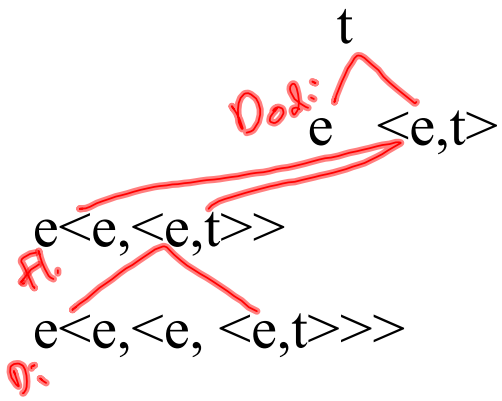
<e,<e,<e,t>>> + e → <e,<e,t>>

<e,<e,t>> + e → <e,t>

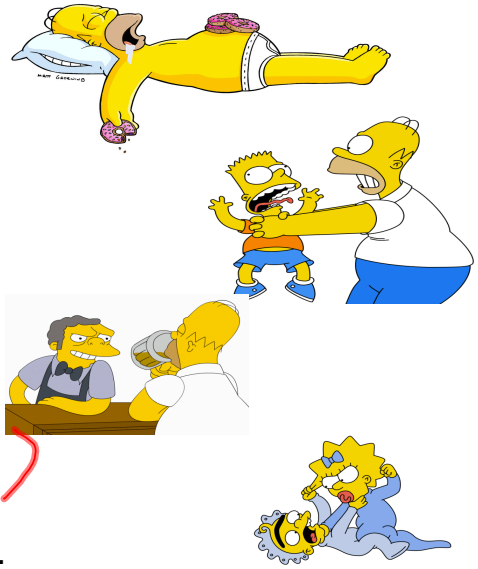
<e,t> + e → t

Dodi





Of what type are the words in italics in the following sentences?



1. Homer *sleeps.*

<e,t>

2. *Homer chokes* Bart.

<e,<e,t>>

3. Moe *sells* beer to Homer.

<e,<e,<e,t>>>

4. Maggie *hates* Baby Gerald.

<e,<e,t>>

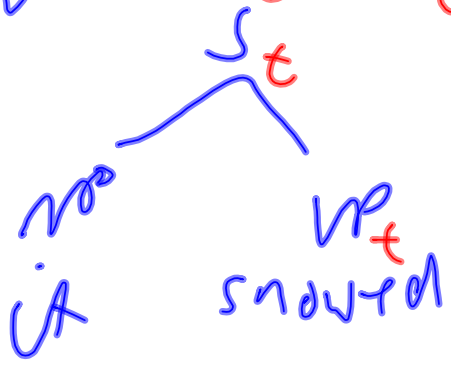
Try to come up with sentences containing words of the following types:

1. <e,t>
   teacher writes
2. <e,<e,t>>
   the teacher writes a book
3. <e,<e,<e,t>>>
   the teacher writes a letter to a parent.

expletive

It was snowing

$snow_V \sim snow'_t$



"internal (direct) object"

It is raining cats and dogs.

It is raining huge drops.

(e, t)

Expletives

1) weather it | 3) there

2) It bothers me [that this is so complicated].

$\mathcal{N}_e$ $\quad$ $\mathcal{N}_e$ $\quad$ S_t

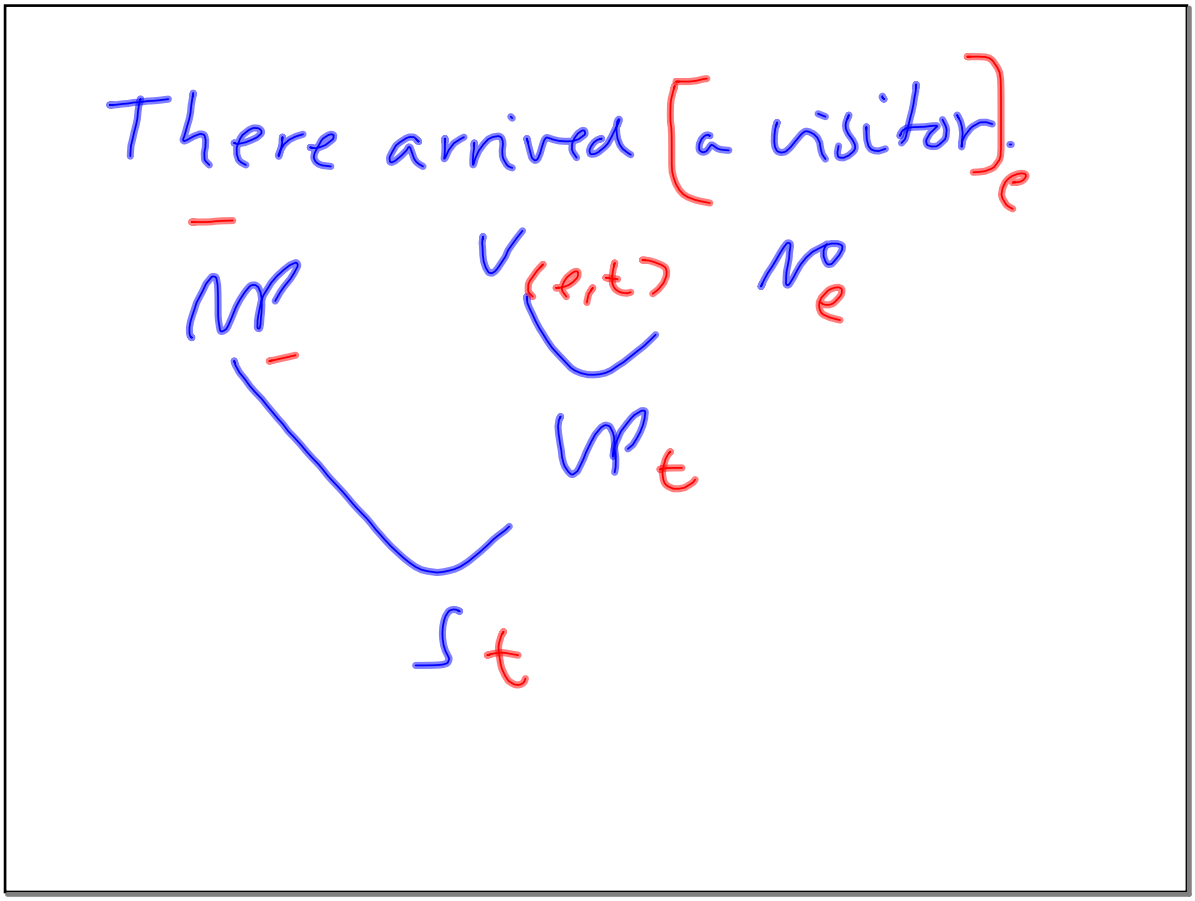
$\langle e, \langle t, t \rangle \rangle$

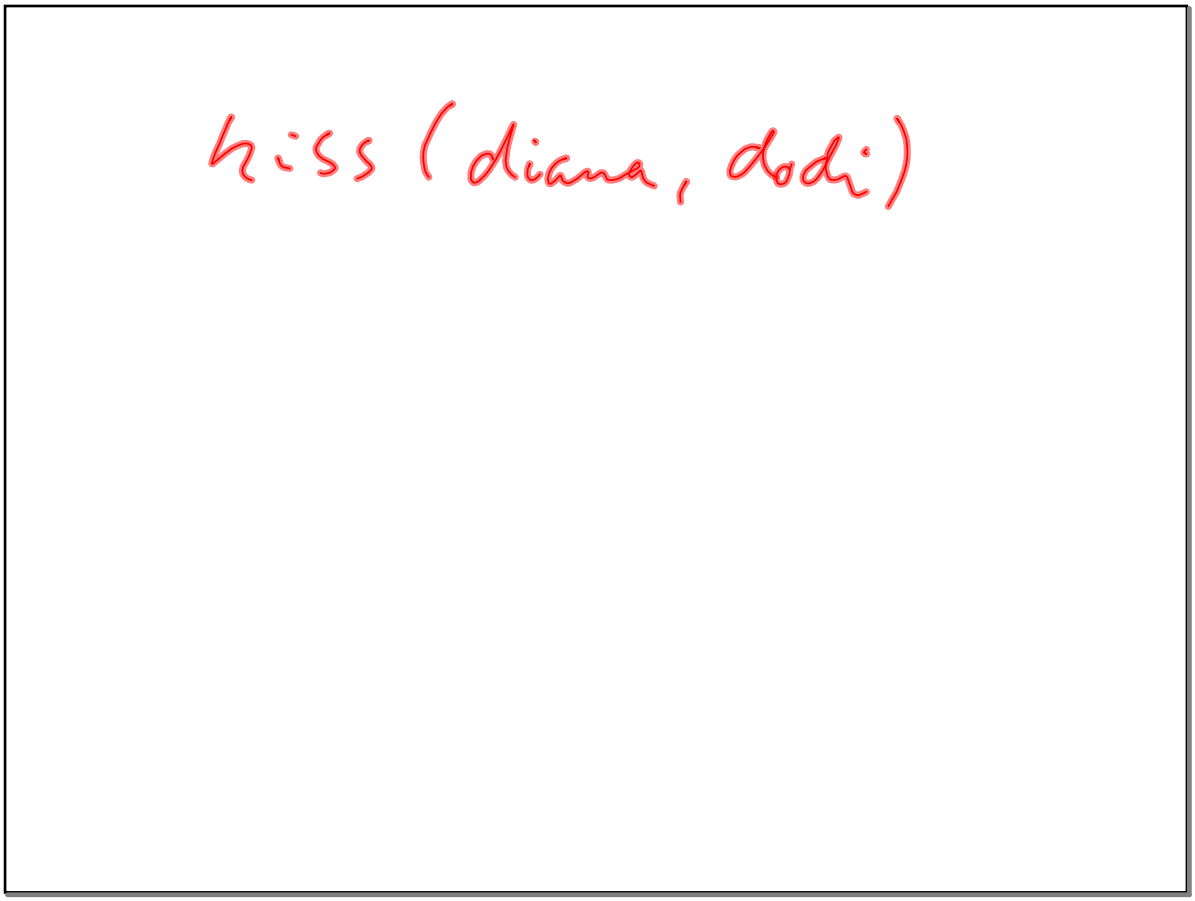
V?

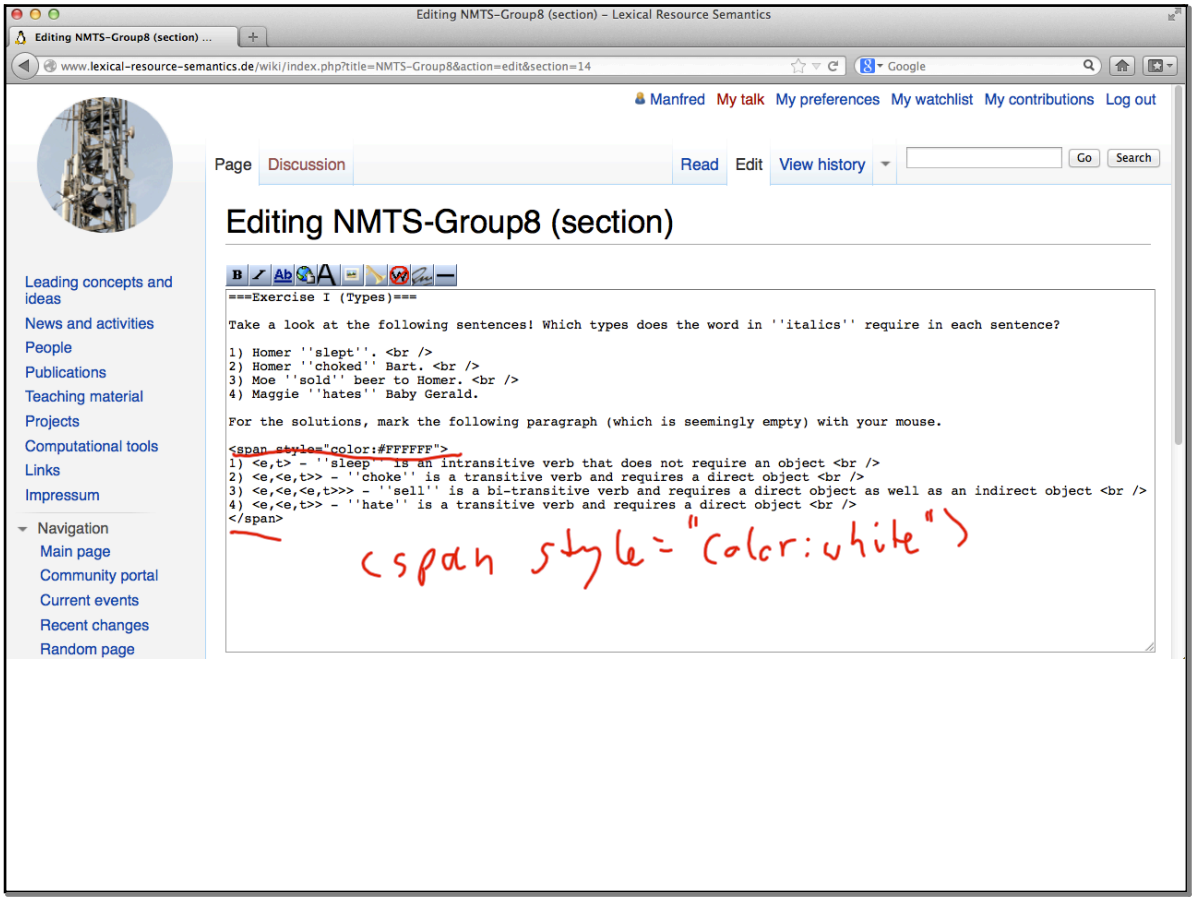
$\langle t, t \rangle$

$\mathcal{N}_t$

S_t


There arrived [a visitor]e
V(e,t)
Ne
Vt
St


kiss (diana, dodi)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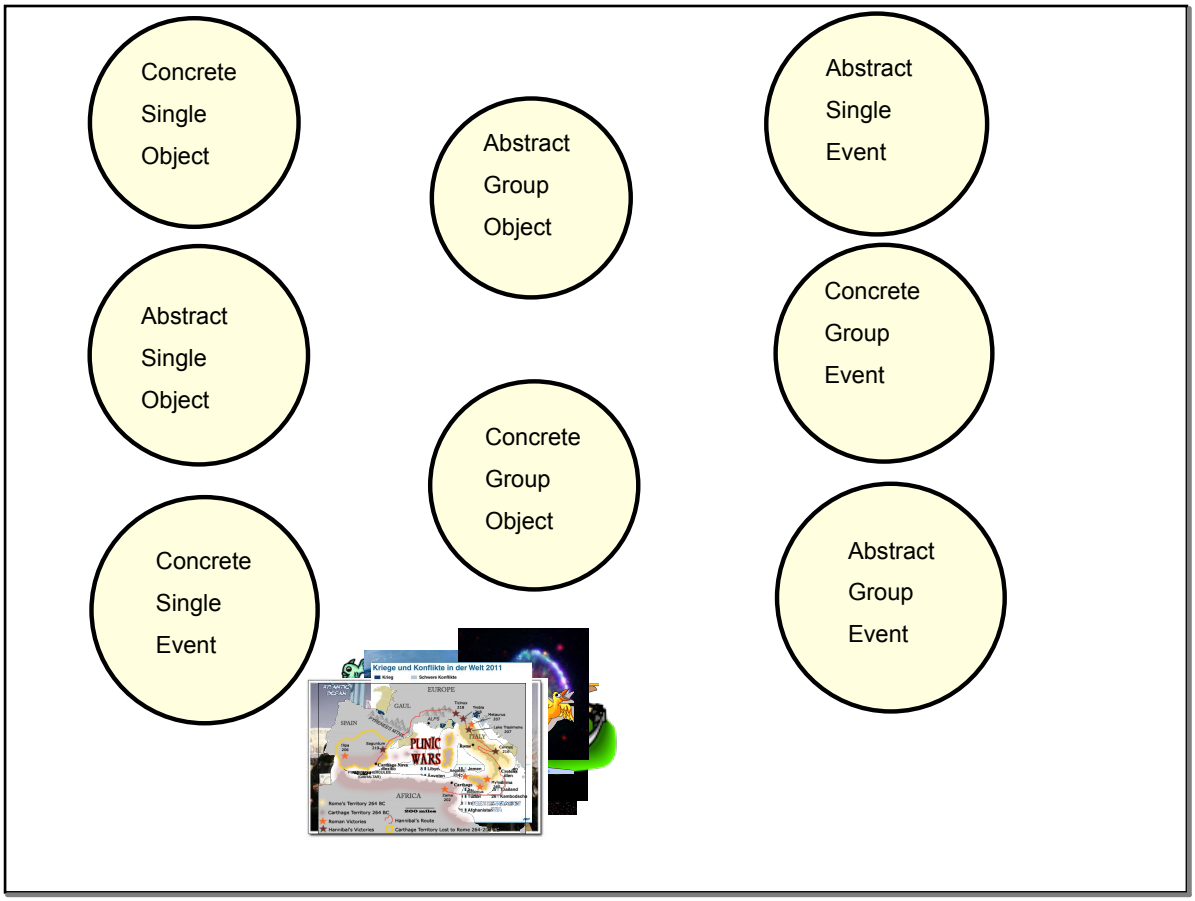
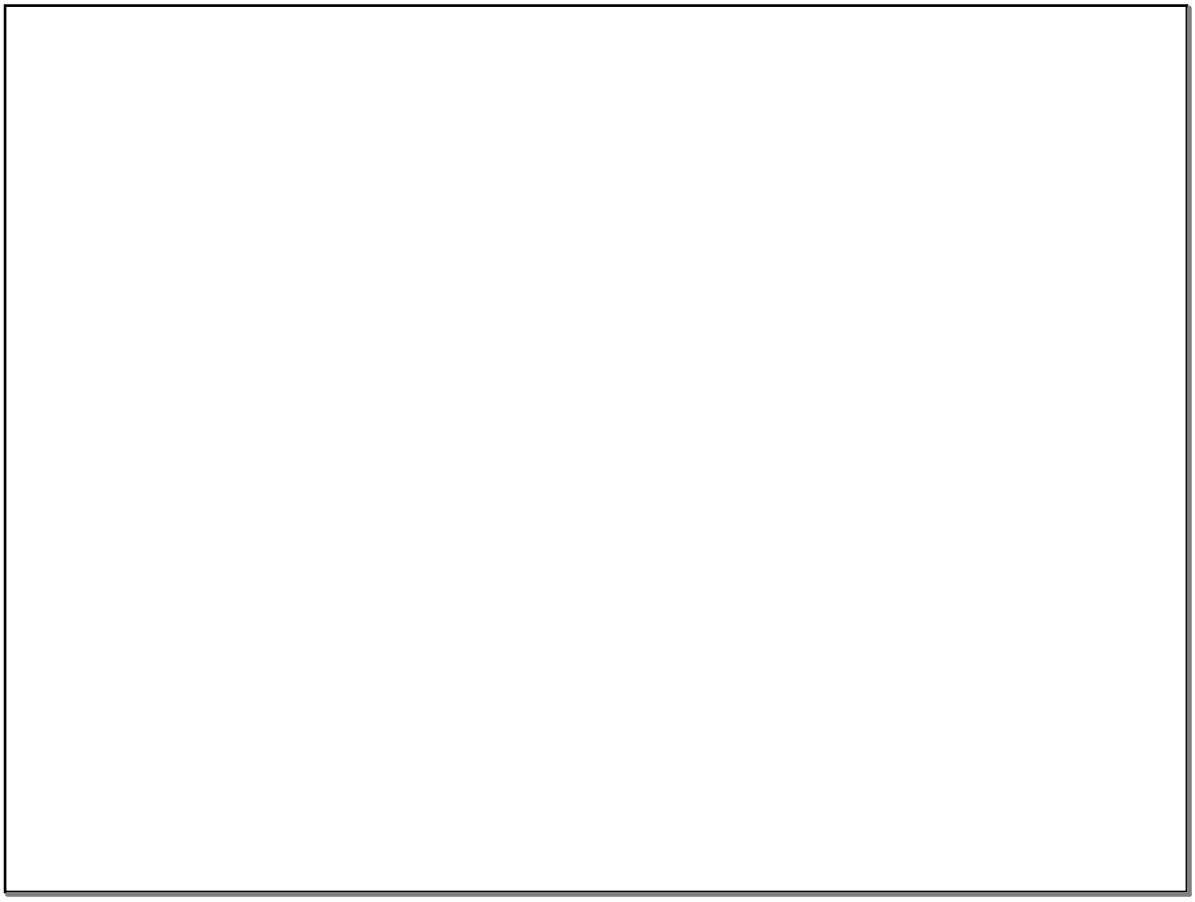
===Exercise I (Types)===
Take a look at the following sentences! Which types does the word in ''italics'' require in each sentence?
1) Homer ''slept''.
2) Homer ''choked'' Bart.
3) Moe ''sold'' beer to Homer.
4) Maggie ''hates'' Baby Gerald.
For the solutions, mark the following paragraph (which is seemingly empty) with your mouse.

1) <e,t> - ''sleep'' is an intransitive verb that does not require an object
2) <e,<e,t>> - ''choke'' is a transitive verb and requires a direct object
3) <e,<e,<e,t>>> - ''sell'' is a bi-transitive verb and requires a direct object as well as an indirect object
4) <e,<e,t>> - ''hate'' is a transitive verb and requires a direct object


Concrete Single Object
Abstract Group Object
Abstract Single Event
Abstract Single Object
Concrete Group Event
Concrete Group Object
Concrete Single Event
Abstract Group Event
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