3.1 The lecture slides show how the reading in which “a book” takes scope over “every student” in the sentence “every student reads a book” can be derived with the Cooper-storage technique. Show that there is an alternative derivation for this reading (i.e., a different derivation for the same reading).

3.2 Try to extend the semantics lexicon from the lecture (slide 14) with an entry for the preposition “at.” The semantic representation should be a complex λ-term that uses a constant at’ of type ⟨e, ⟨e, t⟩⟩.

Hint 1: The λ-term is similar to the λ-term for transitive verbs.

Hint 2: Assume that the semantic representation for the phrase ”student at a university” is λx(student’(x) ∧ ∃y(university’(y) ∧ at’(y)(x))).

3.3 Compute one semantic representation for the sentence ”every student at a university reads a book,” using either Cooper-Storage or Nested Cooper Storage. Beta-Reduce the result as far as possible.

You may assume λx(student’(x) ∧ ∃y(university’(y) ∧ at’(y)(x))) as the translation of ”student at a university” if you have any troubles with exercise 3.2

3.4 The sentence ”every student at a university reads a book” has in total five different scope readings:

(a) ∀x((S(x) ∧ ∃y(U(y) ∧ A(y)(x))) → ∃z(B(z) ∧ R(z)(x))

(b) ∃y(U(y) ∧ ∀x((S(x) ∧ A(y)(x))) → ∃z(B(z) ∧ R(z)(x))

(c) ∃z(B(z) ∧ ∀x((S(x) ∧ ∃y(U(y) ∧ A(y)(x))) → R(z)(x))

(d) ∃z(B(z) ∧ ∃y(U(y) ∧ ∀x((S(x) ∧ A(y)(x))) → R(z)(x))

(e) ∃y(U(y) ∧ ∃z(B(z) ∧ ∀x((S(x) ∧ A(y)(x))) → R(z)(x))

where S stands for “student,” U for “university,” B for “book,” R for “reads,” and A for “at.”

Show how these readings can be derived with *Nested Cooper Storage*. You don‘t need to compute the corresponding semantic representations explicitly – it is sufficient to indicate for each reading of the sentence which operation (storage, retrieval, or application) needs to be performed at which node in the syntax tree to derive the reading.

Q1, Q2, Q3: To be turned in Tuesday, 2013-05-21

Q4: To be turned in Thursday, 2013-05-23