FLST WS 2009/2010 – Semantics – Exercise sheet 2

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Exercises will be discussed on Friday, January 15.

1. Let j be a constant of type e, M a constant of type ⟨e, t⟩, S a constant of type ⟨⟨e, t⟩, ⟨e, t⟩⟩, and C a constant of type ⟨⟨e, t⟩, t⟩. Determine whether the following expressions are well-formed expressions of type theory. Give the type for the well-formed ones.

    a. S(M(j))
    b. S(M)
    c. S(M)(j)   [=(S(M))(j); function application is left associative!]
    d. C(M)
    e. C(M)(j)
    f. C(S(M))
    g. S(S(M))(j)

Assume that j translates "John", M translates "walks", S translates "quickly", and C translates "someone" (the second-order predicate which is true of every predicate which has a non-empty denotation). Give the natural language sentences which the type-logic expressions are representations of.

2. Translate the following sentences into formulae of type theory. Represent "the-salami", "is-working", "the-book" by single constants of appropriate type. State the translation key and indicate the types of the various constants
(Example: John ⇒ j:e).

    a. John sleeps soundly.
    b. John sleeps, presumably.
    c. Harry slices the-salami carefully.
    d. John gives Mary the-book.
    e. Everyone likes Bill.

Remark: Only type-logical *expressions* are asked for, not for denotational interpretation. If you are uncertain about the type of an expression, ask for the type of the argument it takes, and the type of the complex expression it returns. Take "everyone" in e. to be the topmost function constant.