Homework 4

September 29, 2014

Exercise 1

In the home page of the course, there is a description of an evaluator for simply typed lambda-calculus with closures (Th 25 Sep). Show Progress and Preservation for this evaluator.

Exercise 2

We can define the reflexive, transitive closure of $\rightarrow$ by the rules

$$\frac{}{t \rightarrow^* t} \qquad \frac{t \rightarrow t_1 \quad t_1 \rightarrow^* t'}{t \rightarrow^* t'}$$

We say that a relation R is *confluent* iff whenever $R(x, y)$ and $R(x, z)$ then there exists t such that $R(y, t)$ and $R(z, t)$. Show that $\rightarrow^*$ is confluent whenever the following condition holds: if $x \rightarrow y$ and $x \rightarrow^* z$ then there exists t such that $y \rightarrow^* t$ and $z \rightarrow^* t$.