

Homework 04

February 26, 2020

In order to convert our small step semantics to a deterministic nature, we need to amend the rules so that we don't need to choose between evaluating the left and right side. The rules will be amended so that the left side will always be evaluated to completion before the right side of an operation will be evaluated. The \otimes operator will stand for each operation in $\{+, -, *\}$. The new rules read:

$$\frac{a_1 \Longrightarrow a'_1}{a_1 \otimes a_2 \Longrightarrow a'_1 \otimes a_2} [\otimes_{ss} 1]$$
$$\frac{a_2 \Longrightarrow a'_2}{v_1 \otimes a_2 \Longrightarrow v_1 \otimes a'_2} [\otimes_{ss} 2]$$

The change to $[\otimes_{ss} 2]$ ensures that rule 1 must be applied completely first until the left hand side of the \otimes is reduced to a value. As a result, the small step semantics are now deterministic. All other rules presented in the text remain the same.