Homework 2 Isaac Kim Professor Snyder CS 463 Feb 10, 2023

3.1

a)

E-orelse1 = $\frac{t_1 \to t_1'}{\text{orelse } t_1 t_2 \to \text{orelse } t_1' t_2}$

E-orelse2 = $\frac{}{\text{orelse (optional } t) \ t_2 \to t}$

E-orelse3 = $\frac{}{\text{orelse (empty) } t_2 \to t_2}$

b)

E-get1 = $\frac{t \to t'}{\text{get } t \to \text{get } t'}$

E-get2 = $\frac{}{\text{get (optional } t) \to t}$

c)

E-ispresent1 = $\frac{t \to t'}{\text{ispresent } t \to \text{ispresent } t'}$

E-ispresent2 = $\frac{}{\text{ispresent (optional } t) \to \text{true}}$

E-ispresent3 = $\frac{}{\text{ispresent (empty)} \to \text{false}}$

3.2

more = $\lambda a.\lambda b.(a + (\text{orelse } b\ 0))$

isbig = $\lambda x.$ (if ispresent x (if $(x > 1000)$ optional true optional false) empty)