MISTY output: NamePassing

April 14, 2019

Input HO process

R0

$$(\nu s^0)(s^0!\langle\lambda x.x?(y).y\ m\rangle.\bar{m}?(w).(\nu s^1)(w\ s^1\ |$$
$$\bar{s^1}!\langle\lambda v.0\rangle.0)\ |$$
$$\bar{s^0}?(xx).(\nu s^2)(xx\ s^2\ |$$
$$\bar{s^2}!\langle\lambda xy.xy!\langle\lambda xw.xw?(xv).xv\ true\rangle.0\rangle.0))$$

R1

$$\bar{m}?(w).(\nu s^1)(w\ s^1\ |$$
$$\bar{s^1}!\langle\lambda v.0\rangle.0)\ |$$
$$(\nu s^2)(\lambda x.x?(y).y\ m\ s^2\ |$$
$$\bar{s^2}!\langle\lambda xy.xy!\langle\lambda xw.xw?(xv).xv\ true\rangle.0\rangle.0)$$

R2

$$\bar{m}?(w).(\nu s^1)(w\ s^1\ |$$
$$\bar{s^1}!\langle\lambda v.0\rangle.0)\ |$$
$$s^2?(y).y\ m\ |$$
$$\bar{s^2}!\langle\lambda xy.xy!\langle\lambda xw.xw?(xv).xv\ true\rangle.0\rangle.0$$

R3

$$\bar{m}?(w).(\nu s^1)(w\ s^1\ |$$
$$\bar{s^1}!\langle\lambda v.0\rangle.0)\ |$$
$$\lambda xy.xy!\langle\lambda xw.xw?(xv).xv\ true\rangle.0\ m$$

R4

$$\begin{aligned} &\bar{m}?(w).(\nu s^1)(w\ s^1 \mid \\ &\qquad \bar{s^1}!\langle \lambda v.0\rangle.0) \mid \\ &m!\langle \lambda xw.xw?(xv).xv\ true\rangle.0 \end{aligned}$$

R5

$$\begin{aligned} &(\nu s^1)(\lambda xw.xw?(xv).xv\ true\ s^1 \mid \\ &\qquad \bar{s^1}!\langle \lambda v.0\rangle.0) \end{aligned}$$

R6

$$\begin{aligned} &s^1?(xv).xv\ true \mid \\ &\qquad \bar{s^1}!\langle \lambda v.0\rangle.0 \end{aligned}$$

R7

$$\lambda v.0\ true$$

R8

$$0$$

Decomposed HO process

R0

$$
\begin{aligned}
&(\nu c_1, c_2, c_3, c_4, c_5, c_6, c_7, c_8, c_9, c_{10}, c_{11}, c_{12}, c_{13}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\bar{c_1}!\langle\rangle.0 \mid\\
&(\nu s_1^0)((c_1?().\bar{c_2}!\langle\rangle.\bar{c_{11}}!\langle\rangle.0 \mid\\
&c_2?().s_1^0!\langle[\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])]\rangle.\bar{c_5}!\langle\rangle.0 \mid\\
&c_5?().\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&(\nu s_1^1)((c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0)) \mid\\
&c_{11}?().\bar{s_1^0}?([xx]).\bar{c_{12}}!\langle[xx]\rangle.0 \mid\\
&(\nu s_1^2)((c_{12}?([xx]).\bar{c_{13}}!\langle[xx]\rangle.\bar{c_{14}}!\langle\rangle.0 \mid\\
&c_{13}?([xx]).xx\ [s_1^2] \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))))
\end{aligned}
$$

R1

$$
\begin{aligned}
&(\nu c_2, c_3, c_4, c_5, c_6, c_7, c_8, c_9, c_{10}, c_{11}, c_{12}, c_{13}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^0)((\nu s_1^1)((\nu s_1^2)((\bar{c_2}!\langle\rangle.\bar{c_{11}}!\langle\rangle.0 \mid\\
&c_2?().s_1^0!\langle[\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])]\rangle.\bar{c_5}!\langle\rangle.0 \mid\\
&c_5?().\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&c_{11}?().\bar{s_1^0}?([xx]).\bar{c_{12}}!\langle[xx]\rangle.0 \mid\\
&c_{12}?([xx]).\bar{c_{13}}!\langle[xx]\rangle.\bar{c_{14}}!\langle\rangle.0 \mid\\
&c_{13}?([xx]).xx\ [s_1^2] \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0)))))
\end{aligned}
$$

R2

$$
\begin{aligned}
&(\nu c_3, c_4, c_5, c_6, c_7, c_8, c_9, c_{10}, c_{11}, c_{12}, c_{13}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^0)((\nu s_1^1)((\nu s_1^2)((\bar{c_{11}}!\langle\rangle.0 \mid\\
&s_1^0!\langle[\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])]\rangle.\bar{c_5}!\langle\rangle.0 \mid\\
&c_5?().\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&c_{11}?().\bar{s_1^0}?([xx]).\bar{c_{12}}!\langle[xx]\rangle.0 \mid\\
&c_{12}?([xx]).\bar{c_{13}}!\langle[xx]\rangle.\bar{c_{14}}!\langle\rangle.0 \mid\\
&c_{13}?([xx]).xx\ [s_1^2] \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0)))))
\end{aligned}
$$

R3

$$
\begin{aligned}
&(\nu c_3, c_4, c_5, c_6, c_7, c_8, c_9, c_{10}, c_{12}, c_{13}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^0)((\nu s_1^1)((\nu s_1^2)((s_1^0!\langle[\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])]\rangle.\bar{c_5}!\langle\rangle.0 \mid\\
&c_5?().\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{s_1^0}?([xx]).\bar{c_{12}}!\langle[xx]\rangle.0 \mid\\
&c_{12}?([xx]).\bar{c_{13}}!\langle[xx]\rangle.\bar{c_{14}}!\langle\rangle.0 \mid\\
&c_{13}?([xx]).xx\ [s_1^2] \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0)))))
\end{aligned}
$$

R4

$$
\begin{aligned}
&(\nu c_3, c_4, c_5, c_6, c_7, c_8, c_9, c_{10}, c_{12}, c_{13}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\nu s_1^2)((\bar{c_5}!\langle\rangle.0 \mid\\
&c_5?().\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_{12}}!\langle[\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])]\rangle.0 \mid\\
&c_{12}?([xx]).\bar{c_{13}}!\langle[xx]\rangle.\bar{c_{14}}!\langle\rangle.0 \mid\\
&c_{13}?([xx]).xx\ [s_1^2] \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))
\end{aligned}
$$

R5

$$
\begin{aligned}
&(\nu c_3, c_4, c_6, c_7, c_8, c_9, c_{10}, c_{12}, c_{13}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\nu s_1^2)((\bar{m}_1?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_{12}}!\langle[\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])]\rangle.0 \mid\\
&c_{12}?([xx]).\bar{c_{13}}!\langle[xx]\rangle.\bar{c_{14}}!\langle\rangle.0 \mid\\
&c_{13}?([xx]).xx\ [s_1^2] \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))
\end{aligned}
$$

R6

$$
\begin{aligned}
&(\nu c_3, c_4, c_6, c_7, c_8, c_9, c_{10}, c_{13}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\nu s_1^2)((\bar{m}_1?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_{13}}!\langle[\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])]\rangle.\bar{c_{14}}!\langle\rangle.0 \mid\\
&c_{13}?([xx]).xx\ [s_1^2] \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))
\end{aligned}
$$

R7

$$
\begin{aligned}
&(\nu c_3, c_4, c_6, c_7, c_8, c_9, c_{10}, c_{14}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\nu s_1^2)((\bar{m}_1?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_{14}}!\langle\rangle.0 \mid\\
&\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])\ (s_1^2) \mid\\
&c_{14}?().\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))
\end{aligned}
$$

R8

$$
\begin{aligned}
&(\nu c_3, c_4, c_6, c_7, c_8, c_9, c_{10}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\nu s_1^2)((\bar{m}_1?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\lambda[y_1].(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().y_1?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1])\ (s_1^2) \mid\\
&\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))
\end{aligned}
$$

R9

$$
\begin{aligned}
&(\nu c_3, c_4, c_6, c_7, c_8, c_9, c_{10}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\nu s_1^2)((\bar{m}_1?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&(\bar{c_3}!\langle\rangle.0 \mid\\
&c_3?().s_1^2?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1]) \mid\\
&\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))
\end{aligned}
$$

R10

$$
\begin{aligned}
&(\nu c_4, c_6, c_7, c_8, c_9, c_{10}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\nu s_1^2)((\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&s_1^2?([y]).\bar{c_4}!\langle[y]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1] \mid\\
&\bar{s_1^2}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0))))
\end{aligned}
$$

R11

$$
\begin{aligned}
&(\nu c_4, c_6, c_7, c_8, c_9, c_{10}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_4}!\langle[\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)]\rangle.0 \mid\\
&c_4?([y]).y\ [m_1] \mid\\
&\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0)))
\end{aligned}
$$

R12

$$
\begin{aligned}
&(\nu c_6, c_7, c_8, c_9, c_{10}, c_{15}, c_{16}, c_{17}, c_{18}, c_{19})\\
&((\nu s_1^1)((\bar{m}_1?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)\ (m_1) \mid\\
&\bar{c_{19}}!\langle\rangle.0 \mid\\
&c_{19}?().0)))
\end{aligned}
$$

R13

$$
\begin{aligned}
&(\nu c_6, c_7, c_8, c_9, c_{10}, c_{15}, c_{16}, c_{17}, c_{18})\\
&((\nu s_1^1)((\bar{m}_1?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\lambda[y_1].(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().y_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)\ (m_1))))
\end{aligned}
$$

R14

$$
\begin{aligned}
&(\nu c_6, c_7, c_8, c_9, c_{10}, c_{15}, c_{16}, c_{17}, c_{18})\\
&((\nu s_1^1)((\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&(\bar{c_{15}}!\langle\rangle.0 \mid\\
&c_{15}?().m_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0))))
\end{aligned}
$$

R15

$$
\begin{aligned}
&(\nu c_6, c_7, c_8, c_9, c_{10}, c_{16}, c_{17}, c_{18})\\
&((\nu s_1^1)((\bar{m_1}?([w]).\bar{c_6}!\langle[w]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&m_1!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)))
\end{aligned}
$$

R16

$$
\begin{aligned}
&(\nu c_6, c_7, c_8, c_9, c_{10}, c_{16}, c_{17}, c_{18})\\
&((\nu s_1^1)((\bar{c_6}!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.0 \mid\\
&c_6?([w]).\bar{c_7}!\langle[w]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)))
\end{aligned}
$$

R17

$$
\begin{aligned}
&(\nu c_7, c_8, c_9, c_{10}, c_{16}, c_{17}, c_{18})\\
&((\nu s_1^1)((\bar{c_7}!\langle[\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])]\rangle.\bar{c_8}!\langle\rangle.0 \mid\\
&c_7?([w]).w\ [s_1^1] \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)))
\end{aligned}
$$

R18

$$
\begin{aligned}
&(\nu c_8, c_9, c_{10}, c_{16}, c_{17}, c_{18})\\
&((\nu s_1^1)((\bar{c_8}!\langle\rangle.0 \mid\\
&\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid\\
&c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid\\
&c_{17}?([xv]).xv\ [true_1])\ (s_1^1) \mid\\
&c_8?().\bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid\\
&c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid\\
&c_{10}?().0 \mid\\
&\bar{c_{18}}!\langle\rangle.0 \mid\\
&c_{18}?().0)))
\end{aligned}
$$

R19

$$(\nu c_9, c_{10}, c_{16}, c_{17}, c_{18})((\nu s_1^1)((\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid c_{17}?([xv]).xv\ [true_1])\ (s_1^1) \mid \bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid c_{10}?().0 \mid \bar{c_{18}}!\langle\rangle.0 \mid c_{18}?().0)))$$

R20

$$(\nu c_9, c_{10}, c_{16}, c_{17})((\nu s_1^1)((\lambda[y_1].(\bar{c_{16}}!\langle\rangle.0 \mid c_{16}?().y_1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid c_{17}?([xv]).xv\ [true_1])\ (s_1^1) \mid \bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid c_{10}?().0)))$$

R21

$$(\nu c_9, c_{10}, c_{16}, c_{17})((\nu s_1^1)(((\bar{c_{16}}!\langle\rangle.0 \mid c_{16}?().s_1^1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid c_{17}?([xv]).xv\ [true_1]) \mid \bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid c_{10}?().0)))$$

R22

$$(\nu c_9, c_{10}, c_{17})((\nu s_1^1)((s_1^1?([xv]).\bar{c_{17}}!\langle[xv]\rangle.0 \mid c_{17}?([xv]).xv\ [true_1] \mid \bar{s_1^1}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid c_9?().0)]\rangle.\bar{c_{10}}!\langle\rangle.0 \mid c_{10}?().0)))$$

R23

$$(\nu c_9, c_{10}, c_{17})((\bar{c_{17}}!\langle[\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid c_9?().0)]\rangle.0 \mid c_{17}?([xv]).xv\ [true_1] \mid \bar{c_{10}}!\langle\rangle.0 \mid c_{10}?().0))$$

R24

$$(\nu c_9, c_{10})((\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid c_9?().0)\ (true_1) \mid \bar{c_{10}}!\langle\rangle.0 \mid c_{10}?().0))$$

R25

$$(\nu c_9)((\lambda[y_1].(\bar{c_9}!\langle\rangle.0 \mid c_9?().0)\ (true_1)))$$

R26

$$(\nu c_9)((\bar{c_9}!\langle\rangle.0 \mid c_9?().0))$$

R27

$$()$$