

ma-join^{11,40}

$$\begin{aligned}
& M_1 \oplus M_2 \\
& \equiv_{\text{def}} \text{ma}\{M_1.1 \oplus M_2.1; \\
& \quad (M_1.2).1 \oplus (M_2.2).1; \\
& \quad (M_1.2.2).1 \oplus (M_2.2.2).1; \\
& \quad (M_1.2.2.2).1 \oplus (M_2.2.2.2).1; \\
& \quad (M_1.2.2.2.2).1 \oplus (M_2.2.2.2.2).1; \\
& \quad (M_1.2.2.2.2.2).1 \oplus (M_2.2.2.2.2.2).1; \\
& \quad (M_1.2.2.2.2.2.2).1 \oplus (M_2.2.2.2.2.2.2).1; \\
& \quad (M_1.2.2.2.2.2.2.2).1 \oplus (M_2.2.2.2.2.2.2.2).1; \\
& \quad (M_1.2.2.2.2.2.2.2.2).1 \oplus (M_2.2.2.2.2.2.2.2.2).1; \\
& \quad (M_1.2.2.2.2.2.2.2.2.2).1 \oplus (M_2.2.2.2.2.2.2.2.2.2).1\}
\end{aligned}$$

clarification:

$$\begin{aligned}
& M_1 \oplus M_2 \\
& \equiv_{\text{def}} \text{ma}\{\text{fpf-join}(\text{IdDeq}; M_1.1; M_2.1); \\
& \quad \text{fpf-join}(\text{KindDeq}; (M_1.2).1; (M_2.2).1); \\
& \quad \text{fpf-join}(\text{IdDeq}; (M_1.2.2).1; (M_2.2.2).1); \\
& \quad \text{fpf-join}(\text{IdDeq}; (M_1.2.2.2).1; (M_2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{product-deq}(\text{Knd}; \text{Id}; \text{KindDeq}; \text{IdDeq}); (M_1.2.2.2.2).1; (M_2.2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{product-deq}(\text{Knd}; \text{IdLnk}; \text{KindDeq}; \text{IdLnkDeq}); (M_1.2.2.2.2.2).1; (M_2.2.2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{IdDeq}; (M_1.2.2.2.2.2).1; (M_2.2.2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{product-deq}(\text{IdLnk}; \text{Id}; \text{IdLnkDeq}; \text{IdDeq}); (M_1.2.2.2.2.2.2).1; (M_2.2.2.2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{KindDeq}; (M_1.2.2.2.2.2.2.2).1; (M_2.2.2.2.2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{KindDeq}; (M_1.2.2.2.2.2.2.2.2).1; (M_2.2.2.2.2.2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{IdDeq}; (M_1.2.2.2.2.2.2.2.2.2).1; (M_2.2.2.2.2.2.2.2.2.2).1); \\
& \quad \text{fpf-join}(\text{IdDeq}; (M_1.2.2.2.2.2.2.2.2.2.2).1; (M_2.2.2.2.2.2.2.2.2.2.2).1)\}
\end{aligned}$$