

Figure 1: timing-pattern

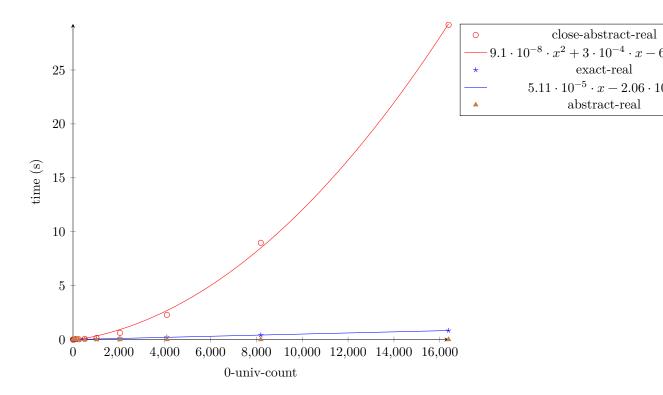


Figure 2: timing-n-polymorphic-universes param-1-n $\,0\,$

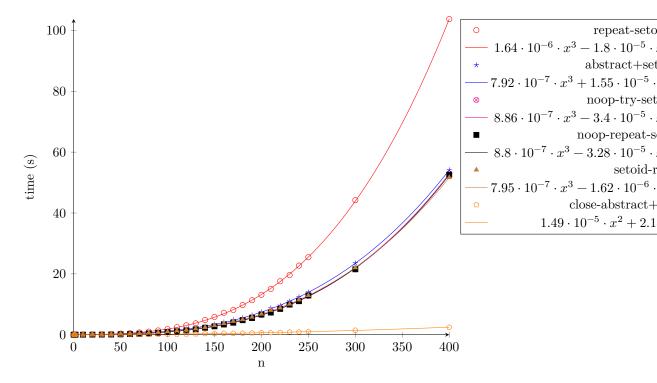
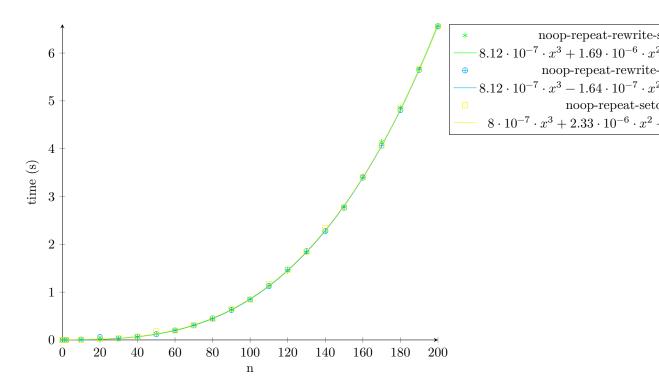


Figure 3: timing-repeat-setoid-rewrite-under-binders



 $Figure\ 4:\ timing-repeat-setoid-rewrite-under-binders-noop$

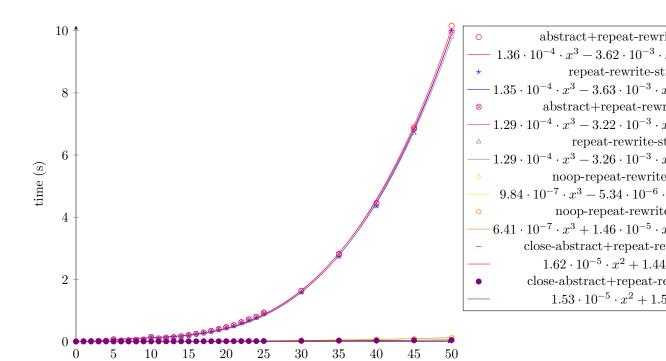
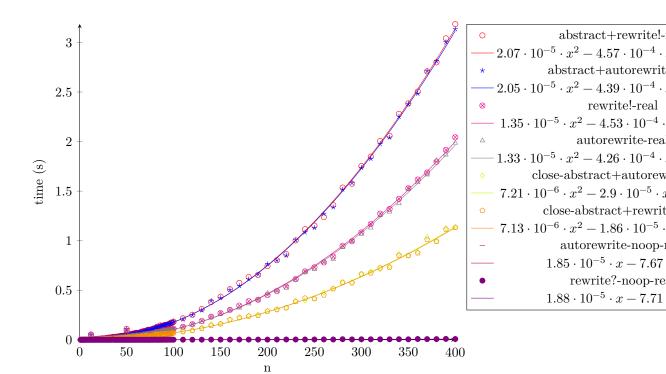


Figure 5: timing-rewrite-strat-under-binders

 \mathbf{n}



 $Figure \ 6: \ timing-rewrite-repeated-app-autorewrite \\$

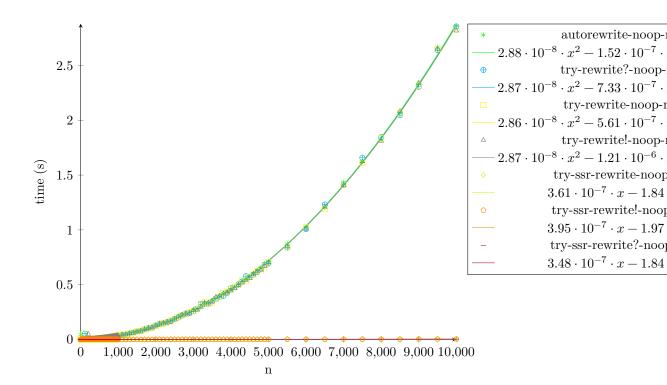
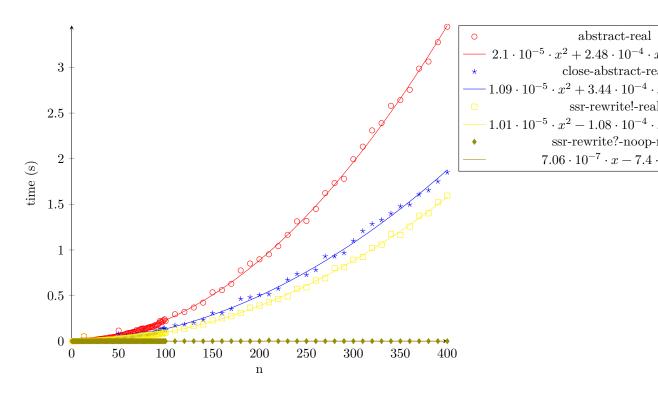
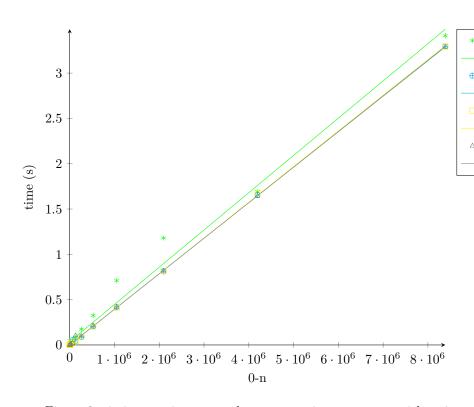


Figure 7: timing-rewrite-repeated-app-autorewrite-noop



 ${\bf Figure~8:~timing\text{-}rewrite\text{-}repeated\text{-}app\text{-}ssrrewrite}$

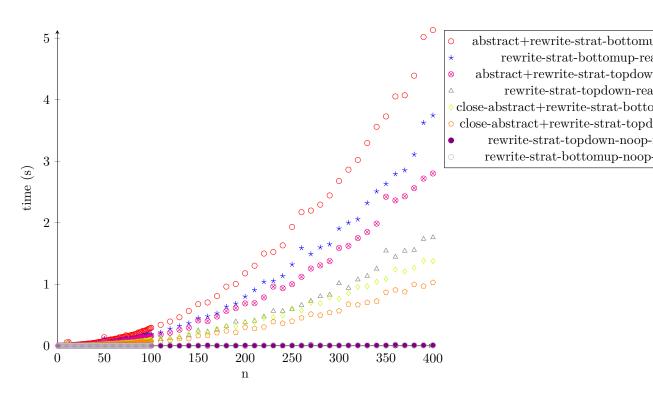


try-ssr-rewrite!-cold-noop-rea $4.11\cdot 10^{-7}\cdot x + 3.63\cdot 10^{-2}$

 $\begin{array}{l} \text{try-ssr-rewrite-noop-real} \\ 3.93 \cdot 10^{-7} \cdot x + 2.94 \cdot 10^{-4} \\ \text{try-ssr-rewrite?-noop-real} \end{array}$

 $\begin{aligned} &3.94\cdot 10^{-7}\cdot x-1\cdot 10^{-3}\\ &\text{try-ssr-rewrite!-noop-real}\\ &3.92\cdot 10^{-7}\cdot x+2.14\cdot 10^{-3} \end{aligned}$

Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$



 $abstract + rewrite - strat - bottom \\ \\$ rewrite-strat-bottomup-rea abstract + rewrite - strat - topdowrewrite-strat-topdown-rea

rewrite-strat-topdown-nooprewrite-strat-bottomup-noop-

 $Figure~10:~timing\mbox{-rewrite-repeated-app-rewrite-strat}$

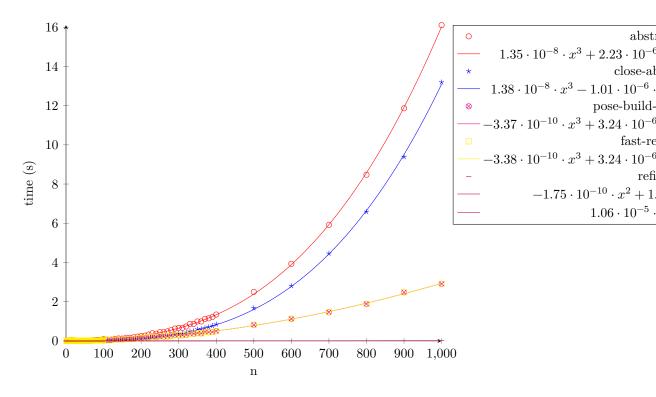
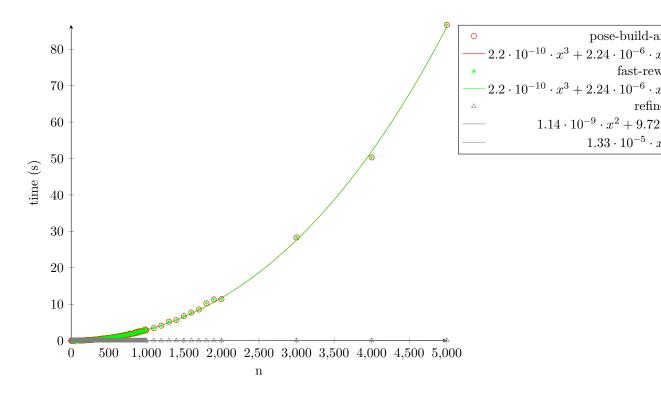
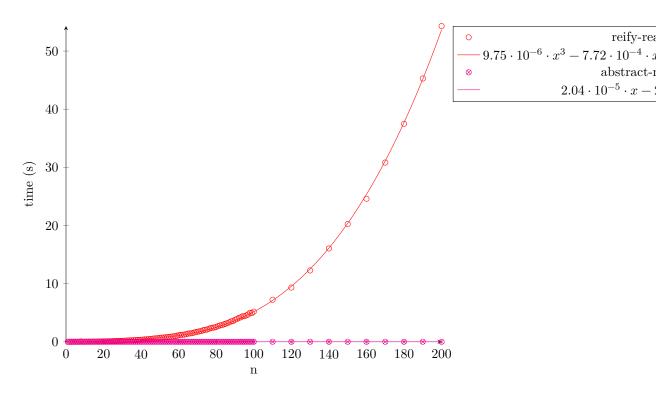


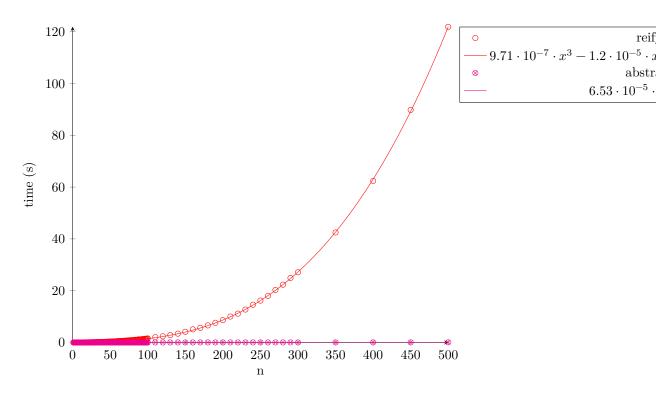
Figure 11: timing-rewrite-repeated-app-fast-rewrite



Figure~12:~timing-rewrite-repeated-app-fast-rewrite-no-abstract



 ${\bf Figure~13:~timing-type class-reification-let-in-HOAS}$



 ${\bf Figure~14:~timing-type class-reification-let-in-PHOAS}$