

Figure 1: timing-pattern

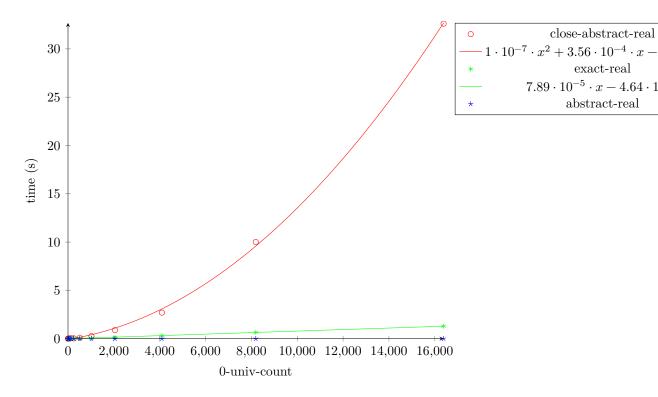
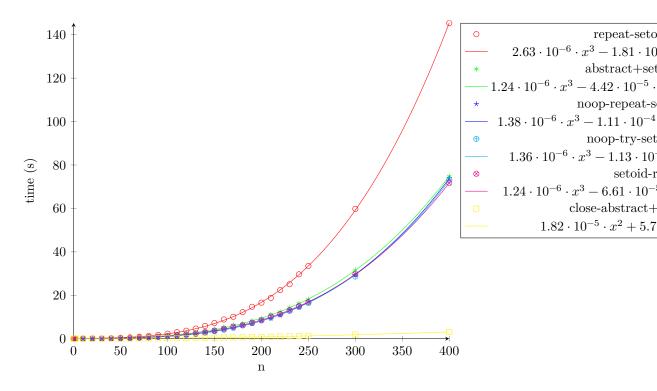


Figure 2: timing-n-polymorphic-universes param-1-n  $\,0\,$ 



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

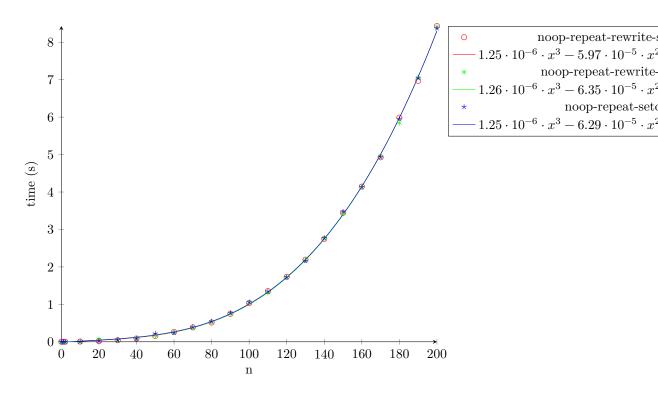
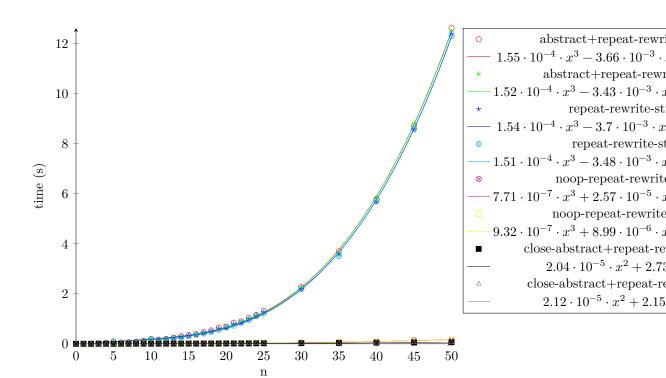
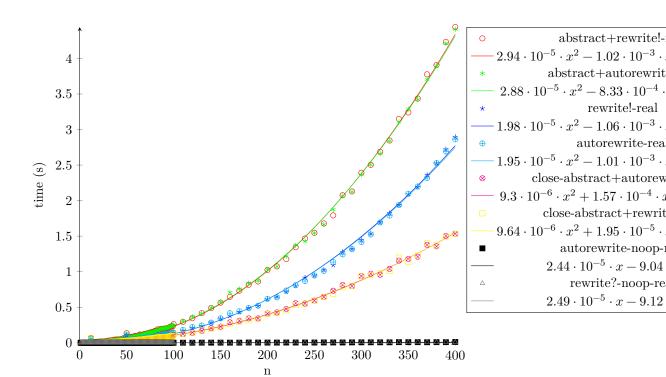


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop



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



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

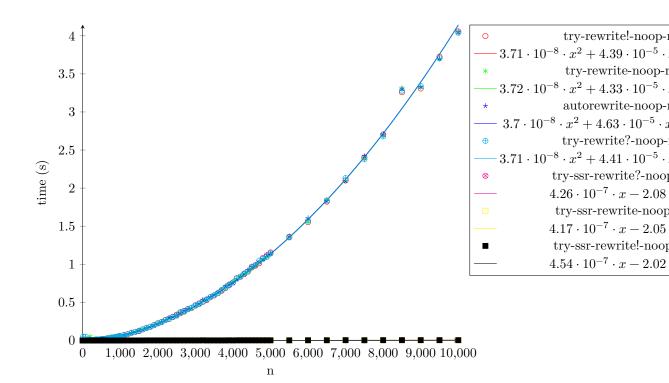
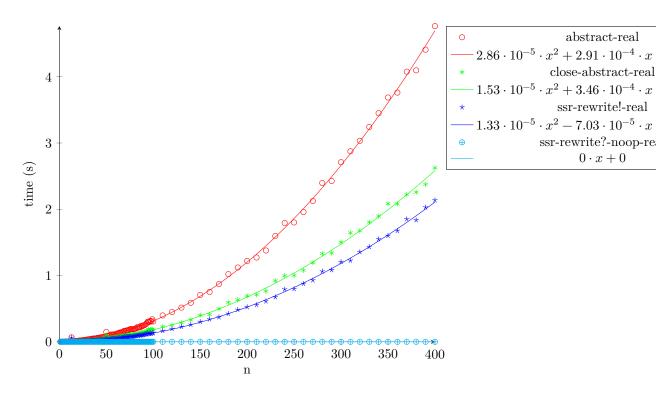
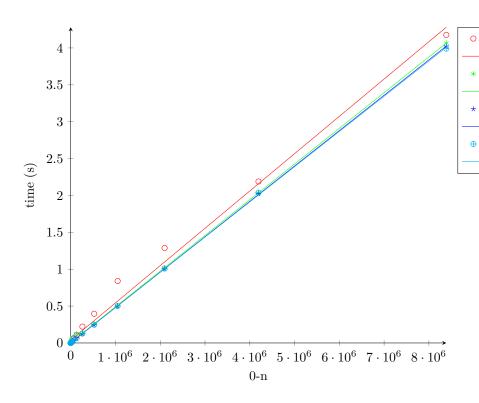


Figure 7: timing-rewrite-repeated-app-autorewrite-noop



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



try-ssr-rewrite!-cold-noop-rea

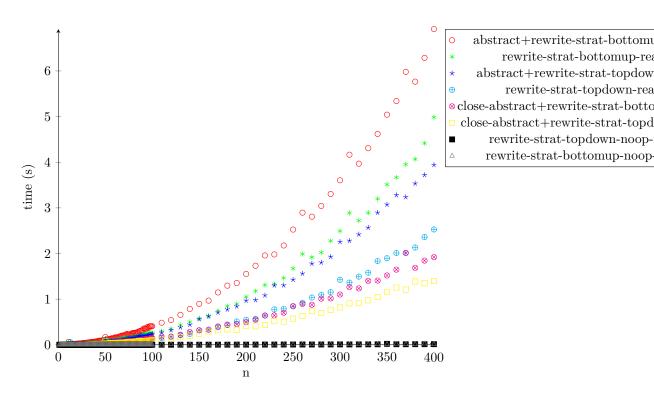
 $5.06 \cdot 10^{-7} \cdot x + 3.72 \cdot 10^{-2}$  try-ssr-rewrite!-noop-real

 $\begin{array}{l} 4.84 \cdot 10^{-7} \cdot x + 6.22 \cdot 10^{-3} \\ \text{try-ssr-rewrite?-noop-real} \end{array}$ 

 $4.8 \cdot 10^{-7} \cdot x + 1.17 \cdot 10^{-4}$  try-ssr-rewrite-noop-real

 $4.77\cdot 10^{-7}\cdot x + 2.64\cdot 10^{-3}$ 

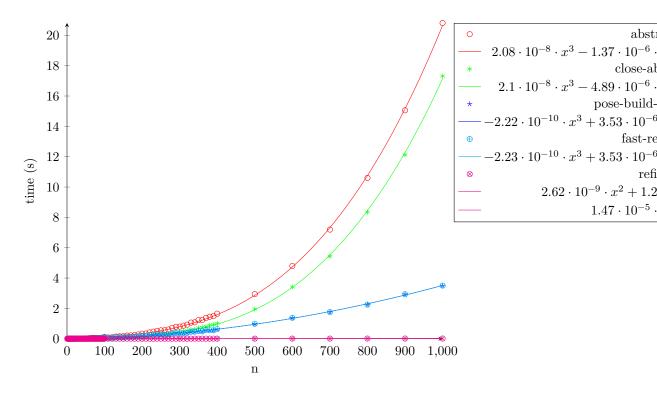
Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn  $\ 1$ 



rewrite-strat-bottomup-rea

rewrite-strat-topdown-rea

 $Figure\ 10:\ timing-rewrite-repeated-app-rewrite-strat$ 



 $Figure~11:~timing\mbox{-rewrite-repeated-app-fast-rewrite}$ 

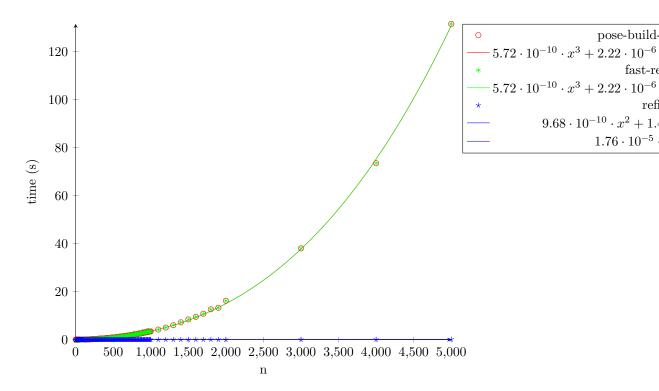
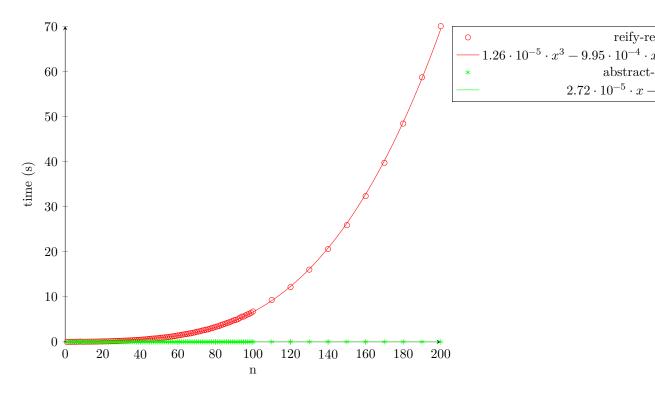
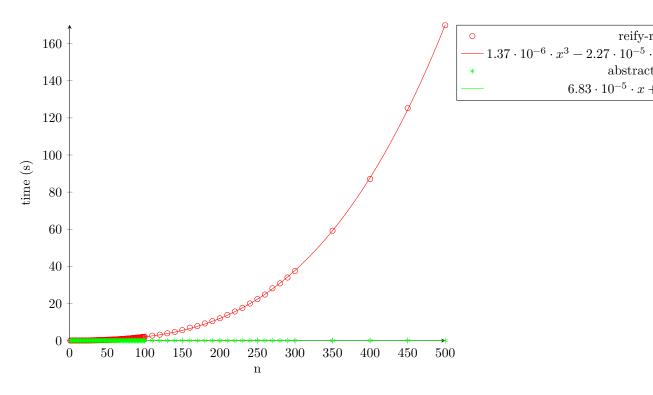


Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract



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



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