

Figure 1: timing-pattern

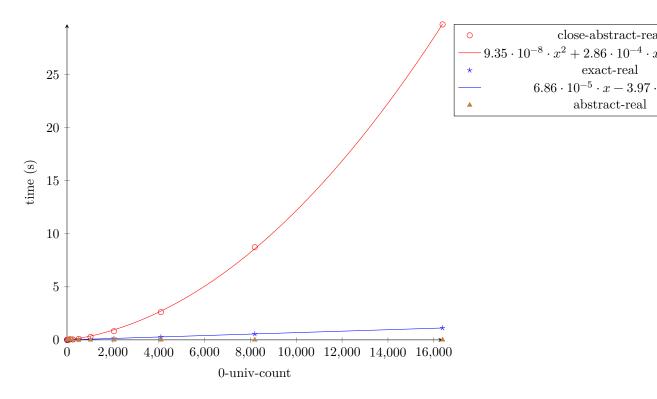
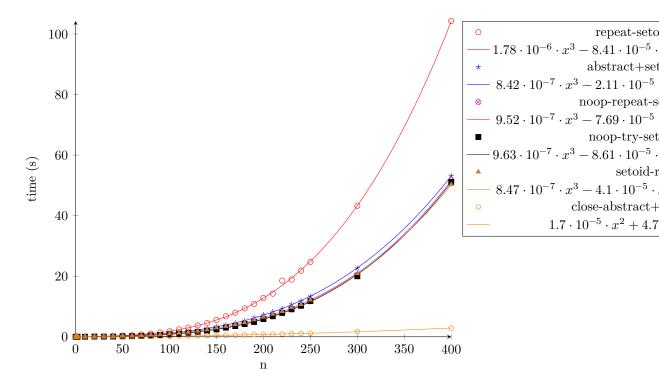


Figure 2: timing-n-polymorphic-universes param-1-n 0



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

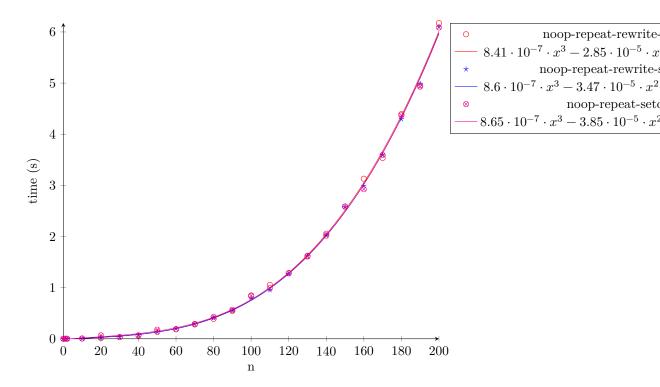
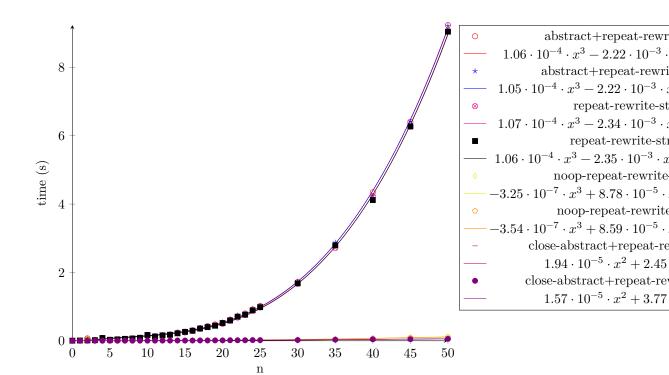
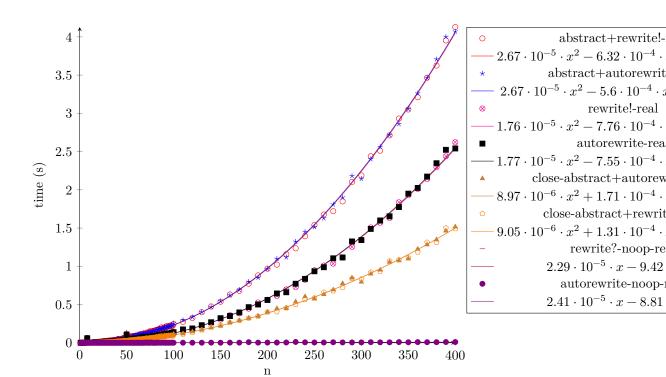


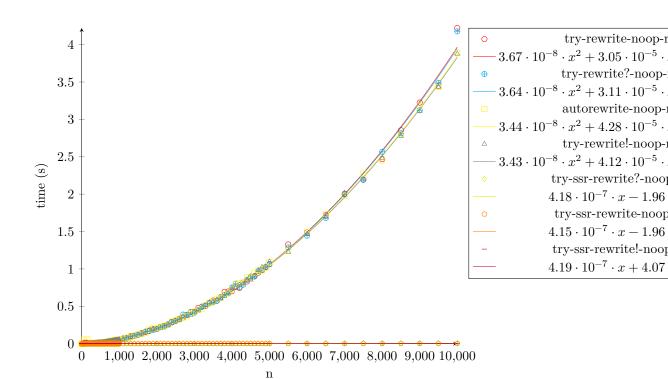
Figure 4: timing-repeat-setoid-rewrite-under-binders-noop



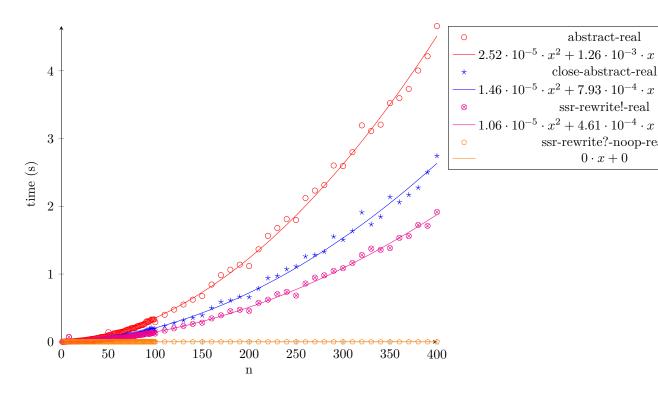
 $Figure\ 5:\ timing-rewrite-strat-under-binders$



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



 $Figure~7:~timing\mbox{-rewrite-repeated-app-autorewrite-noop}$



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

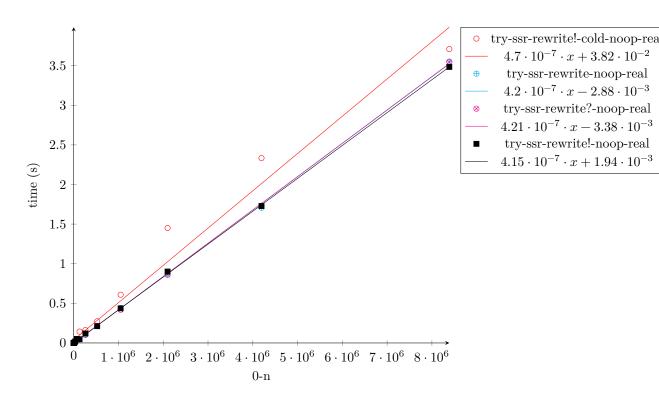
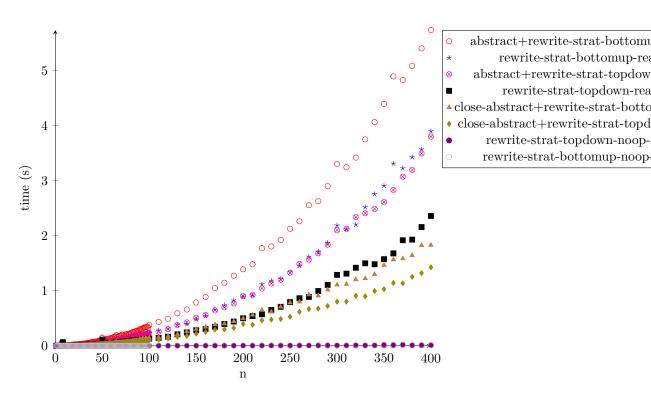


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$

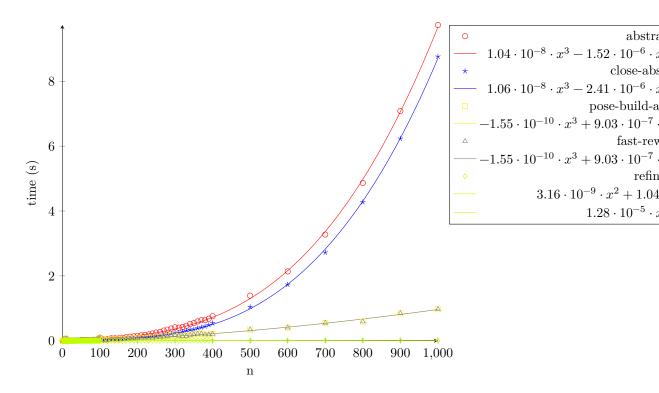


rewrite-strat-bottomup-rea

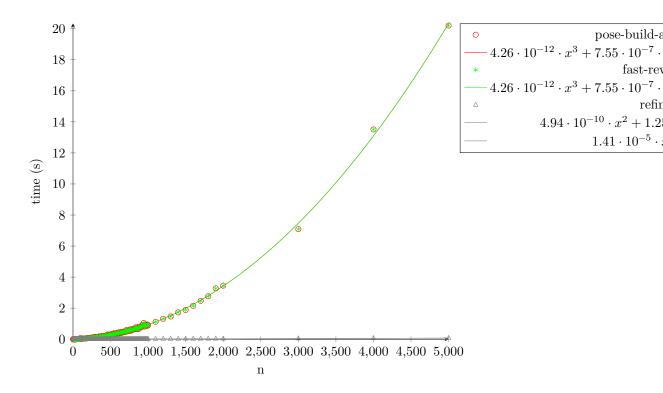
abstract + rewrite - strat - topdowrewrite-strat-topdown-rea

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

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



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



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

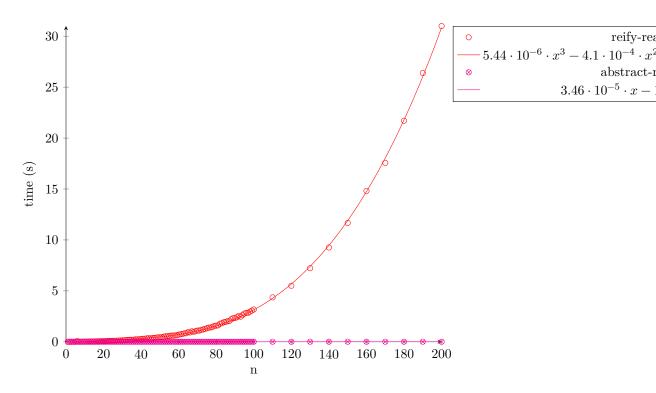


Figure 13: timing-typeclass-reification-let-in-HOAS

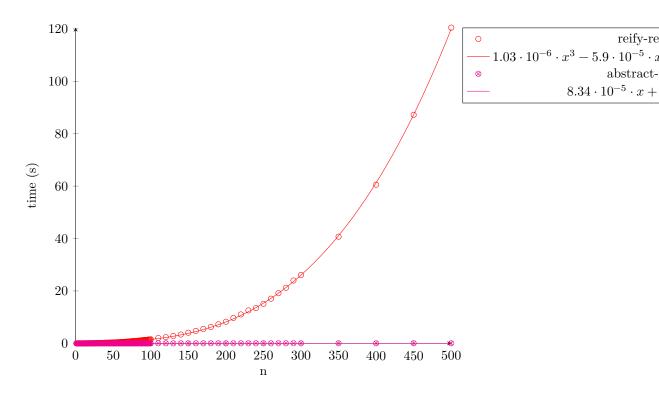
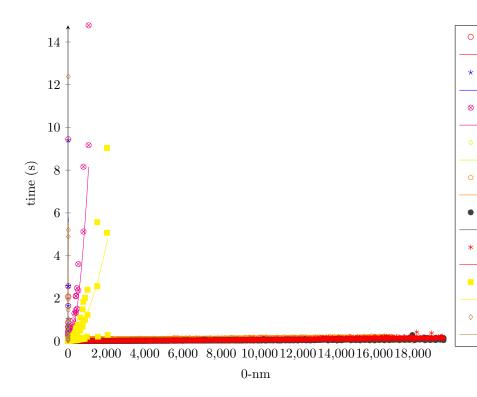


Figure 14: timing-typeclass-reification-let-in-PHOAS



rewrite-strat(bottomup-bot

 $7.25 \cdot 10^{-6} \cdot x^2 - 2.5 \cdot 10^{-4} \cdot x^2$

 $1.21 \cdot 10^{-10} \cdot x^2 + 4.67 \cdot 10^{-6} \cdot$

 $1.23 \cdot 10^{-10} \cdot x^2 + 4.18 \cdot 10^{-6} \cdot$

 $1.02 \cdot 10^{-10} \cdot x^2 + 3.32 \cdot 10^{-6} \cdot$

 $2.08 \cdot 10^{-10} \cdot x^2 + 4.45 \cdot 10^{-6} \cdot \\$

 $9.57 \cdot 10^{-7} \cdot x^2 + 3.51 \cdot 10^{-4} \cdot x^2$

 $-7.22 \cdot 10^{-3} \cdot x^3 + 0.23 \cdot x^2 -$

 $3.8\cdot 10^{-3} \exp{(0.49\cdot (0.49\cdot (0.49\cdot$

 $4.44 \cdot 10^{-3} exp(0.48 \cdot ($

cps+cbn-real

cps+cbv-real

cps+lazy-real

cps+simpl-real

setoid-rewrite-re

cps+vm-compute-

cps+native-compute

Figure 15: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1

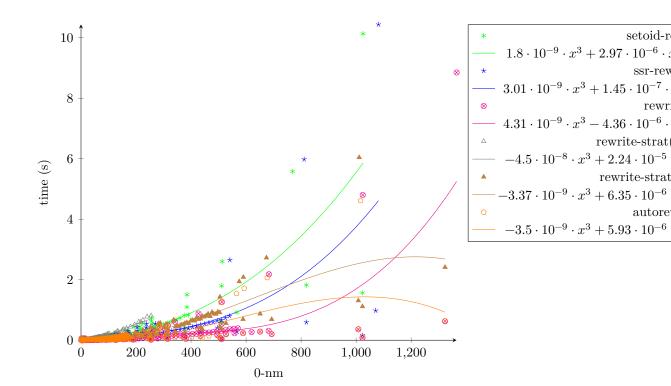
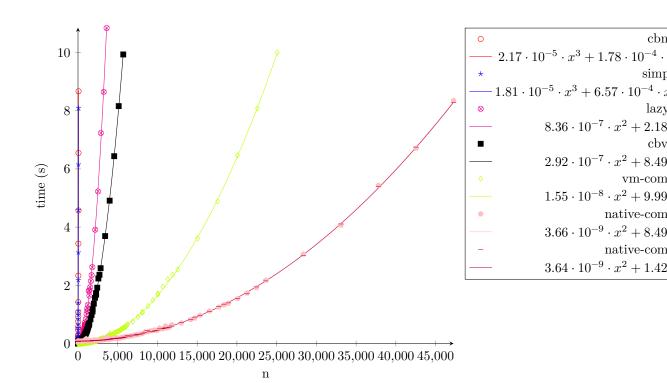


Figure 16: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1

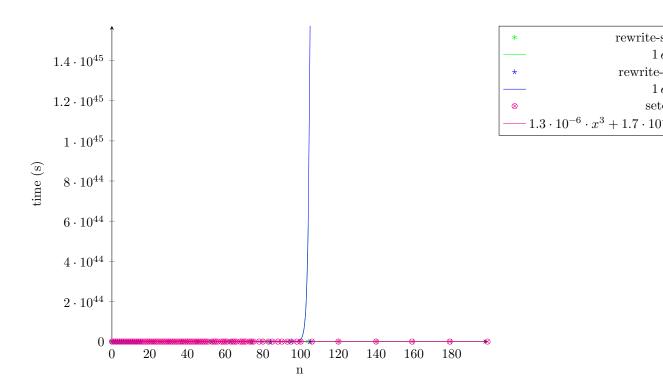


cbn

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Figure 17: timing-sieve-of-eratosthenes



rewrite-

Figure 18: timing-rewrite-under-lets-plus-0 $\,$