

Figure 1: timing-pattern

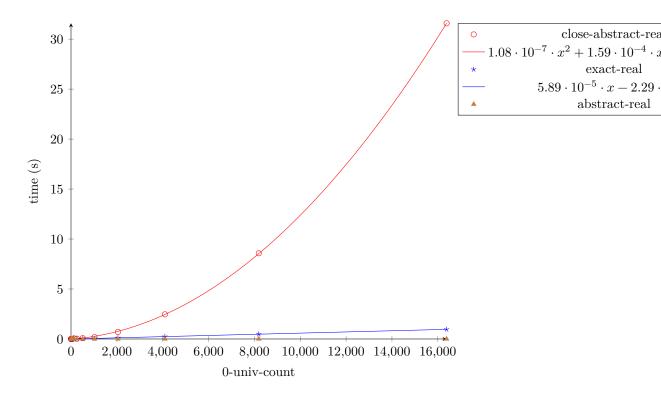
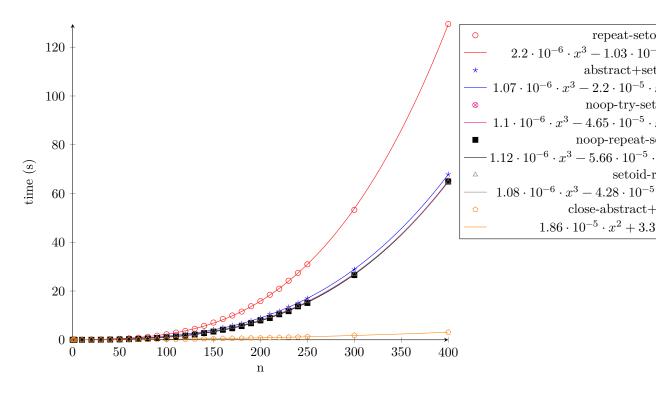
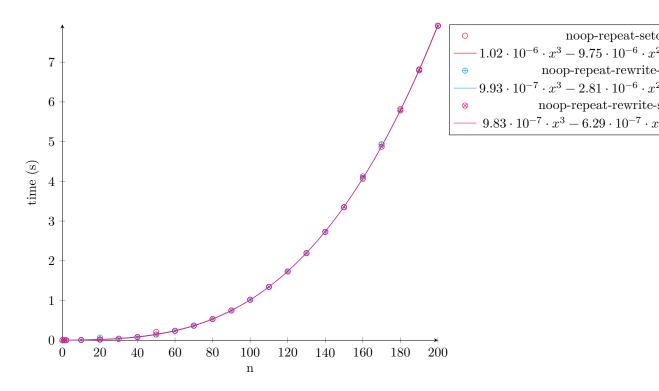


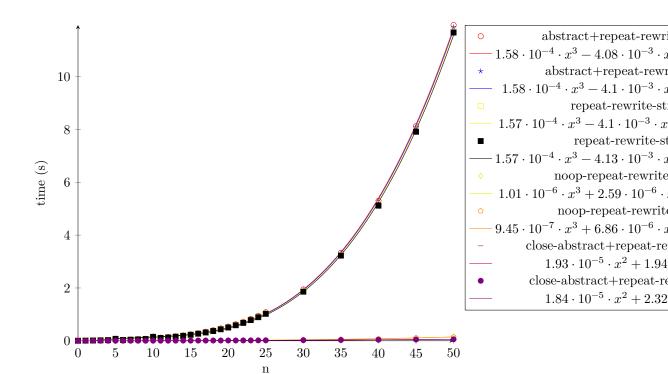
Figure 2: timing-n-polymorphic-universes param-1-n 0



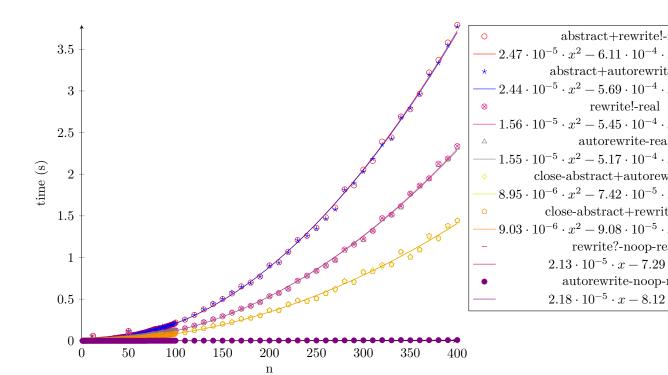
 $Figure \ 3: \ timing-repeat-setoid-rewrite-under-binders$



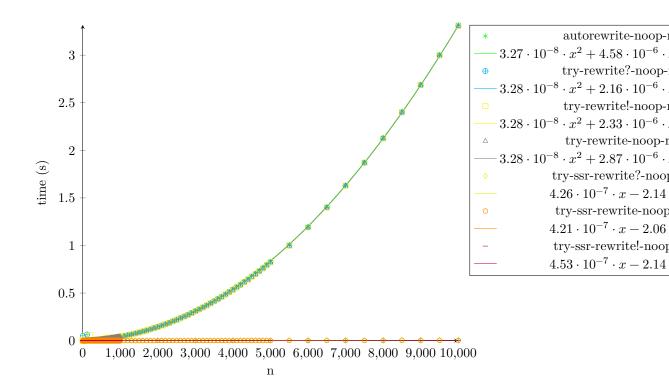
 $Figure\ 4:\ timing-repeat-setoid-rewrite-under-binders-noop$



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



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



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

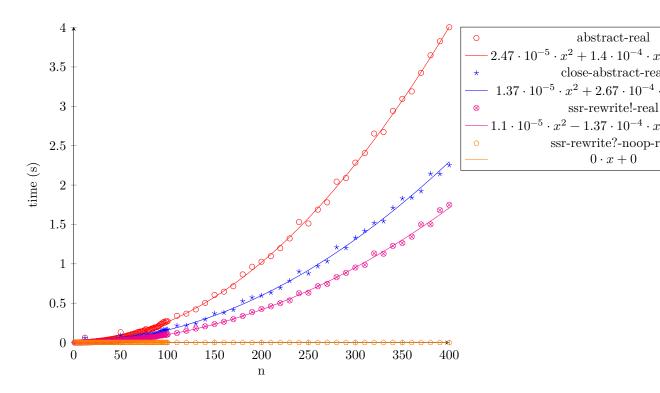
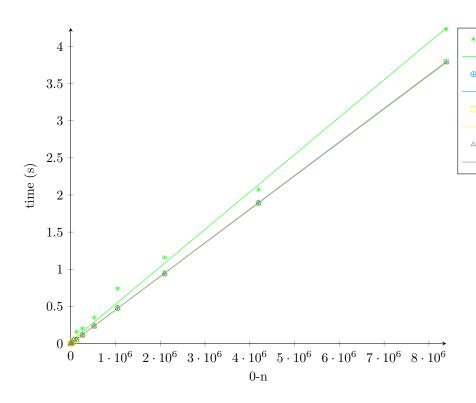


Figure 8: timing-rewrite-repeated-app-ssrrewrite



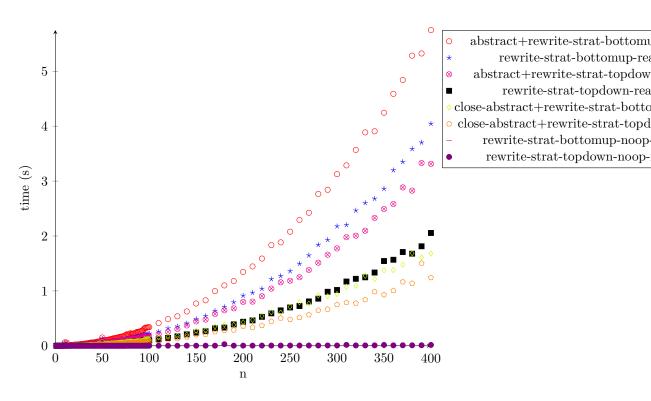
try-ssr-rewrite!-cold-noop-rea

 $5.04 \cdot 10^{-7} \cdot x + 2.49 \cdot 10^{-2}$ try-ssr-rewrite-noop-real

 $\begin{array}{l} 4.53 \cdot 10^{-7} \cdot x + 6.93 \cdot 10^{-5} \\ \text{try-ssr-rewrite!-noop-real} \end{array}$

 $\begin{aligned} &4.52\cdot 10^{-7}\cdot x - 1.41\cdot 10^{-3}\\ &\text{try-ssr-rewrite?-noop-real}\\ &4.51\cdot 10^{-7}\cdot x + 8.62\cdot 10^{-4} \end{aligned}$

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-bottomup-nooprewrite-strat-topdown-noop-

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

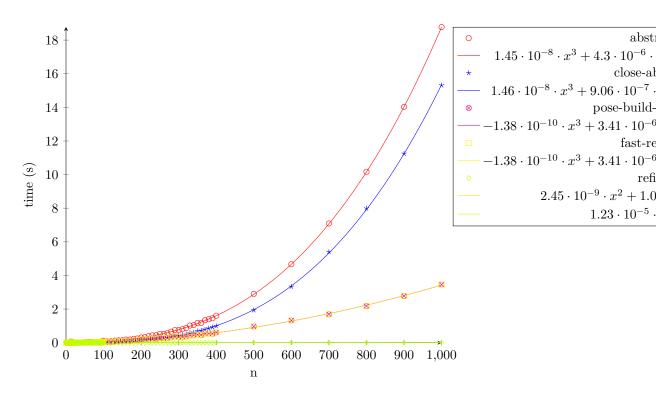


Figure 11: timing-rewrite-repeated-app-fast-rewrite

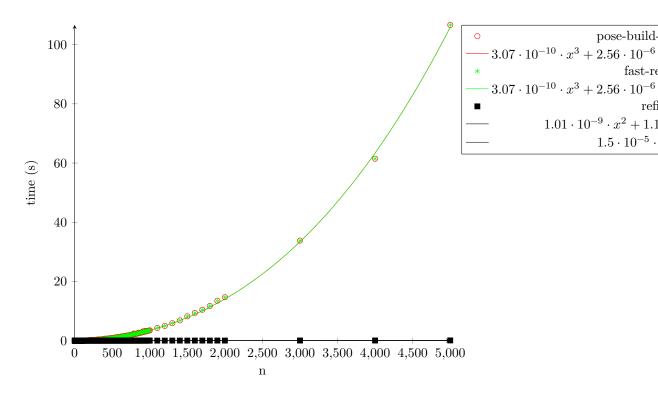
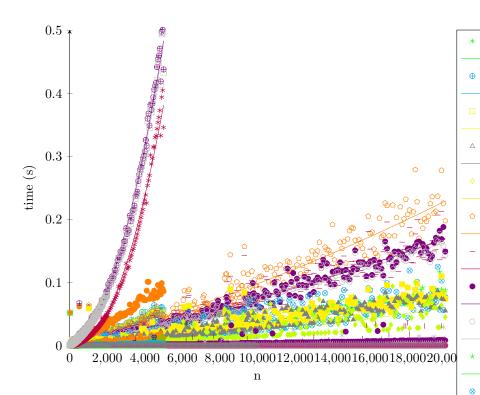


Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract



```
cbv-for-beta-Par
     1.53 \cdot 10^{-10} \cdot x^2 + 1
    reif-for-beta-Paran
    4.15 \cdot 10^{-10} \cdot x^2 + 9
norm-reif-for-beta-Pa
    3.17 \cdot 10^{-10} \cdot x^2 + 9
actual-reif-for-beta-Pa
    2.86 \cdot 10^{-10} \cdot x^2 + 8
lazy-beta-iota-for-beta
    1.07 \cdot 10^{-10} \cdot x^2 + 6
       reif-for-Parametr
    1.67 \cdot 10^{-10} \cdot x^2 + 8
   norm-reif-for-Param
     8.28 \cdot 10^{-11} \cdot x^2 + 6
    reif-for-Parametric
    1.15 \cdot 10^{-10} \cdot x^2 + 6
norm-reif-for-Paramet
    1.15 \cdot 10^{-10} \cdot x^2 + 5
actual-reif-for-Paramet
    6.58 \cdot 10^{-11} \cdot x^2 + 2
   eval-lazy-for-Param
    4.78 \cdot 10^{-11} \cdot x^2 + 3
  actual-reif-for-Paran
    3.52 \cdot 10^{-11} \cdot x^2 + 3
eval-lazy-for-Paramet
    5.02 \cdot 10^{-11} \cdot x^2 + 2
lazy-beta-iota-for-Para
    8.49 \cdot 10^{-11} \cdot x^2 + 1
    cbv-for-beta-Paran
    1.41 \cdot 10^{-10} \cdot x^2 + 2
    cbv-for-Parametric
    2.11 \cdot 10^{-11} \cdot x^2 + 2
       cbv-for-Parametr
```

 $1.81\cdot 10^{-13}\cdot x^2 + 4.00$ lazy-beta-iota-for-Param $4.47\cdot 10^{-12}\cdot x^2 + 2.0$ lazy-beta-iota-for-beta-lazy-beta-iota-for-beta-Param $1.64\cdot 10^{-10}\cdot x^2 + 1.0$ eval-lazy-for-beta-Param $9.35\cdot 10^{-11}\cdot x^2 + 1.0$

 $9.35 \cdot 10^{-11} \cdot x^2 + 3$

 $9.35 \cdot 10^{-11} \cdot x^2 + 3$

 $9.35 \cdot 10^{-11} \cdot x^2 + 3$

 $9.35 \cdot 10^{-11} \cdot x^2 + 3$ pre-for-beta-Param $9.35 \cdot 10^{-11} \cdot x^2 + 3$

transitivity-(Denote-rv)-for-b

transitivity-(Denote-rv)-for

transitivity-(Denote-rv)-for-F

transitivity-(Denote-rv)-for