

Figure 1: Timing of rewrite\_strat and setoid\_rewrite under binders

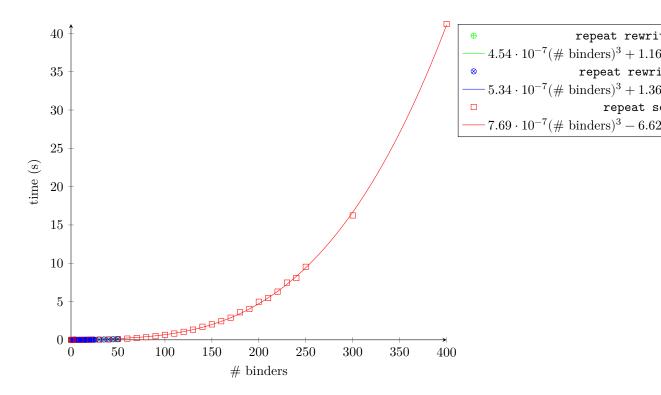
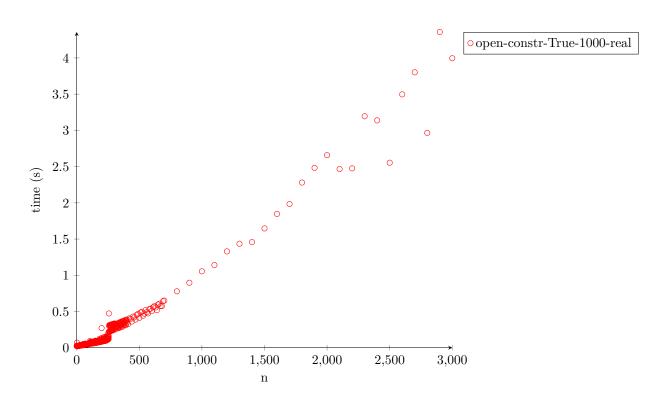
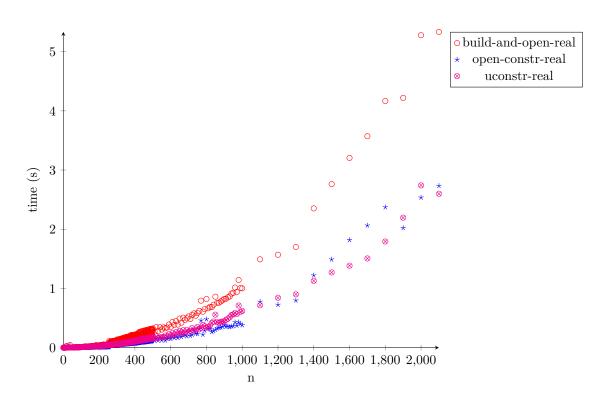


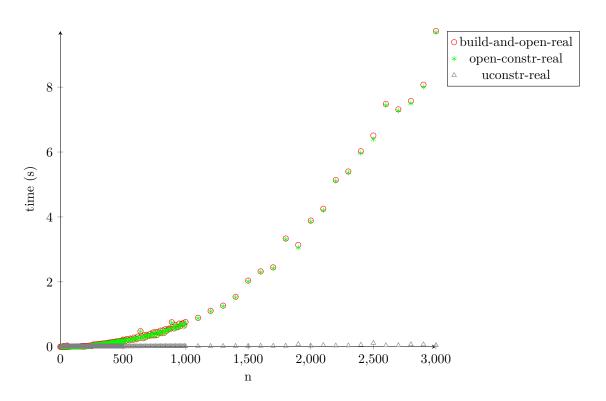
Figure 2: Timing of rewrite\_strat and setoid\_rewrite under binders



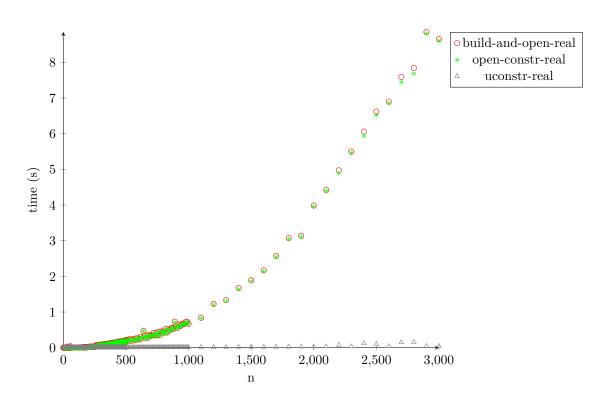
 $\label{eq:Figure 3: timing-do-n-open-constr-True} Figure \ 3: \ timing-do-n-open-constr-True$ 



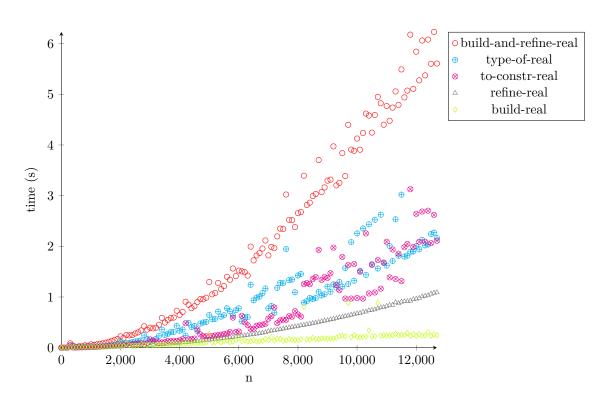
 $Figure\ 4:\ timing-open-constr-n-lambda-no-types-different-names$ 



Figure~5:~timing-open-constr-n-lambda-no-types-no-names



 $Figure\ 6:\ timing-open-constr-n-lambda-no-types-same-names$ 



Figure~7:~timing-app-n-uconstr

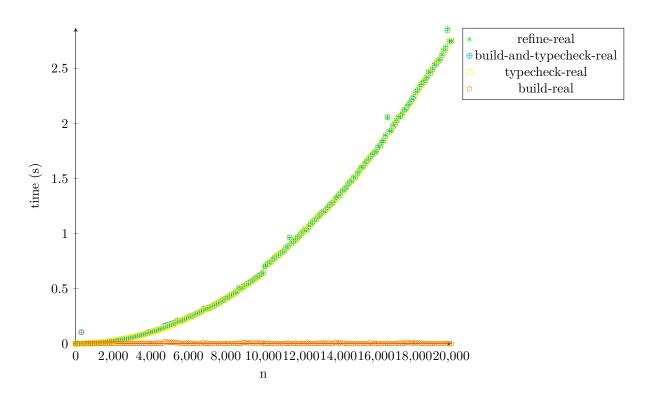


Figure 8: timing-app-n-ltac2

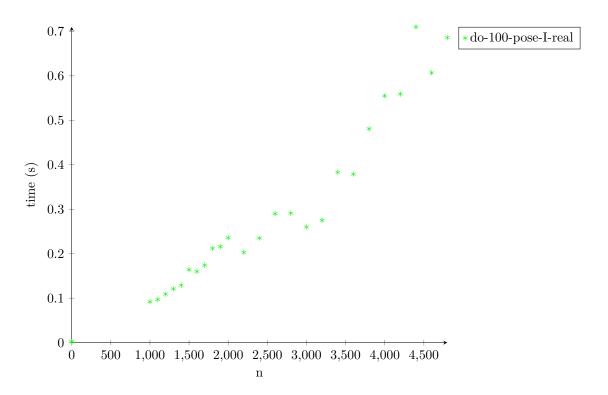


Figure 9: timing-do-n-pose

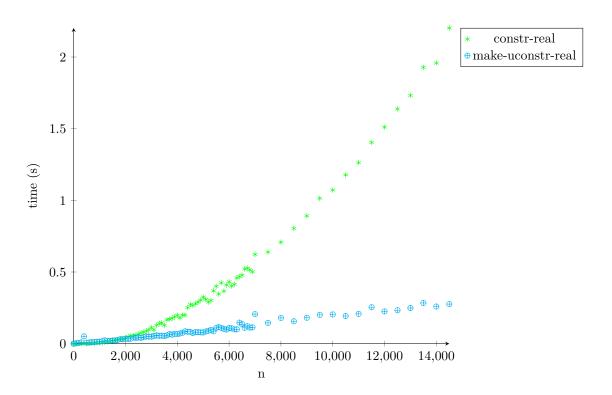


Figure 10: timing-let-n-uconstr

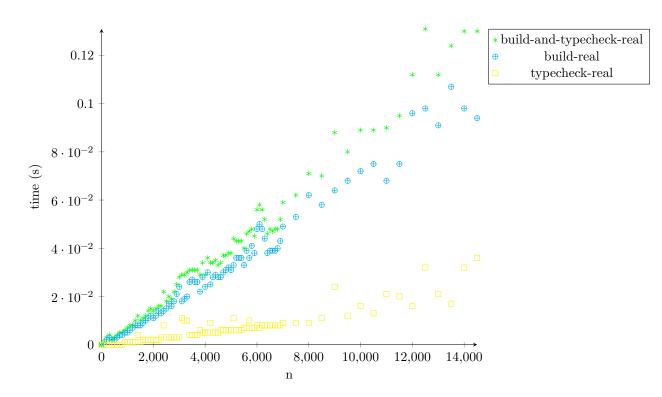


Figure 11: timing-let-n-ltac 2

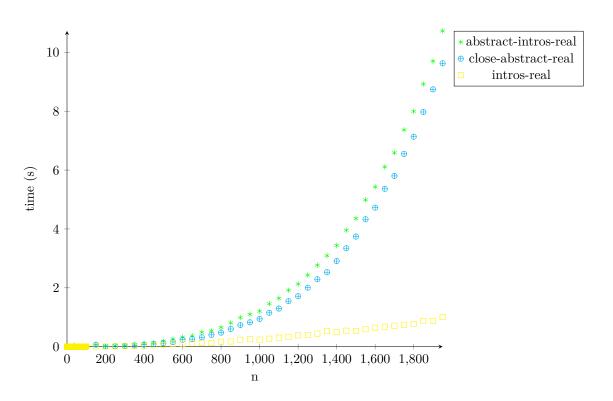


Figure 12: timing-intros-n-let

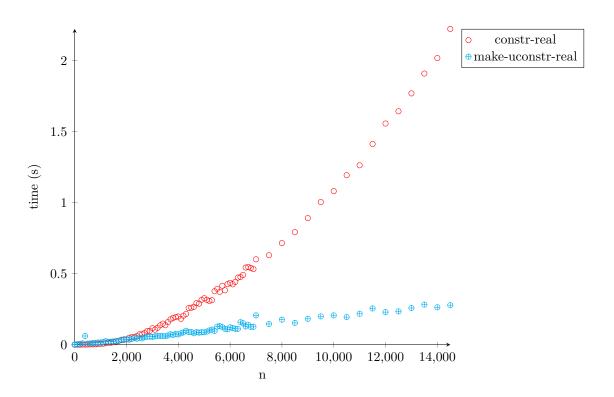


Figure 13: timing-fun-n-uconstr

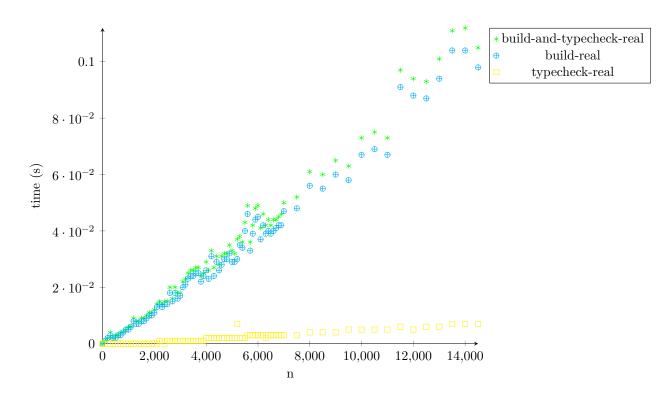


Figure 14: timing-fun-n-ltac2

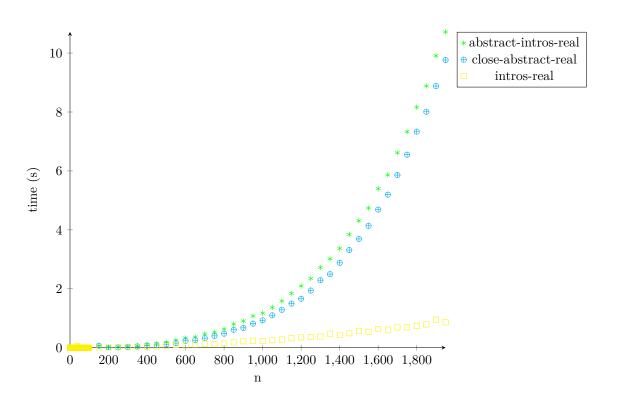


Figure 15: timing-intros-n-fun

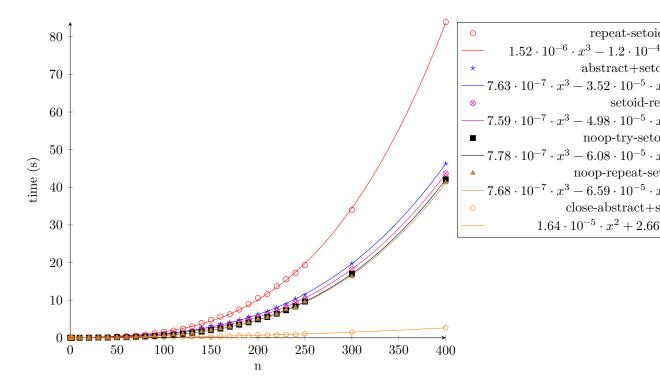


Figure 16: timing-repeat-setoid-rewrite-under-binders

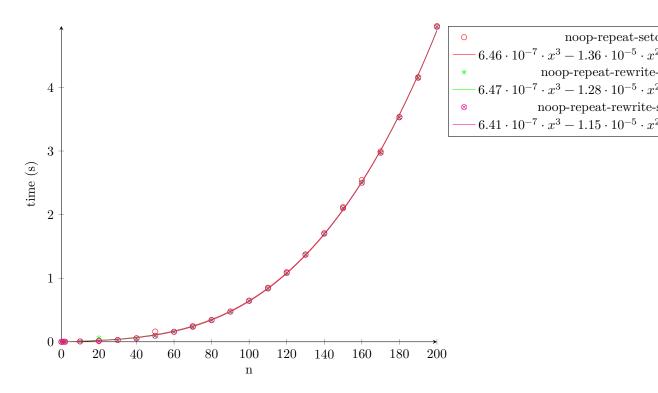
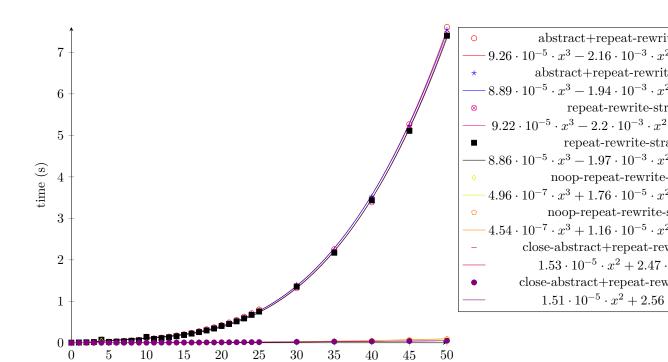


Figure 17: timing-repeat-setoid-rewrite-under-binders-noop



 $Figure\ 18:\ timing-rewrite-strat-under-binders$ 

n

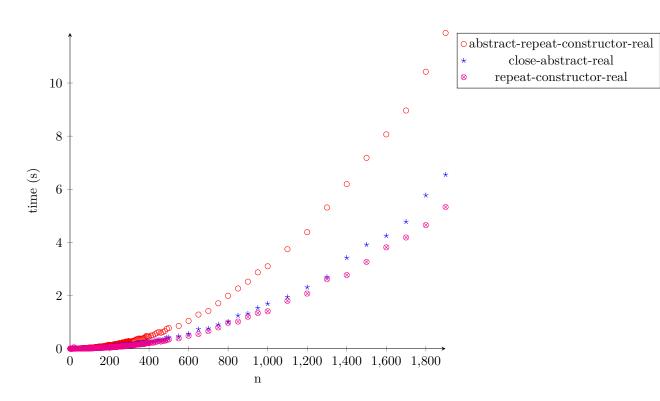


Figure 19: timing-conj-True-repeat-constructor

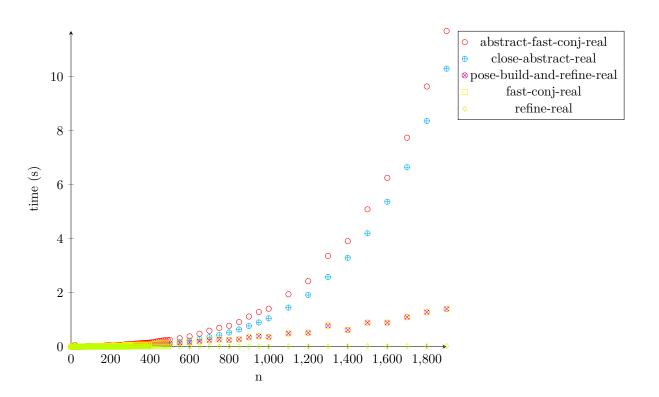


Figure 20: timing-conj-True-fast-conj

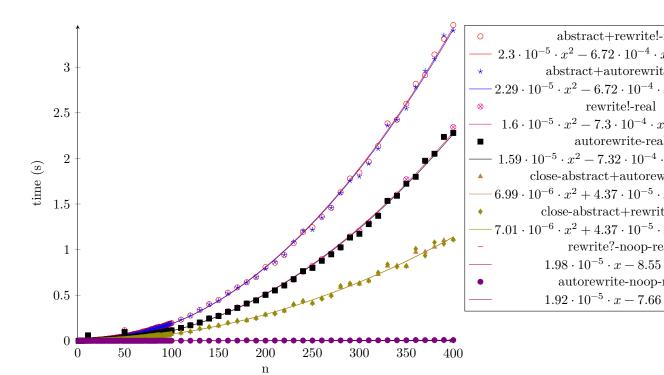


Figure 21: timing-rewrite-repeated-app-autorewrite

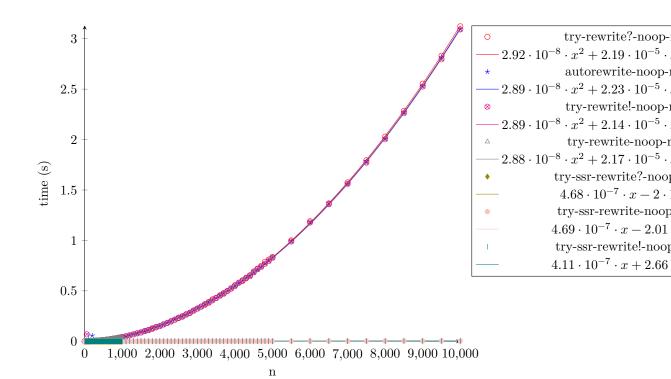


Figure 22: timing-rewrite-repeated-app-autorewrite-noop

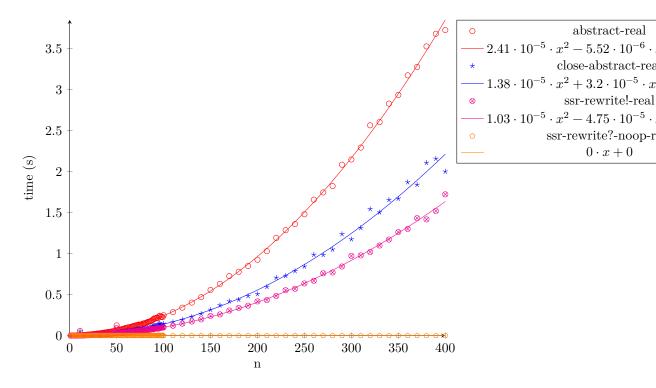
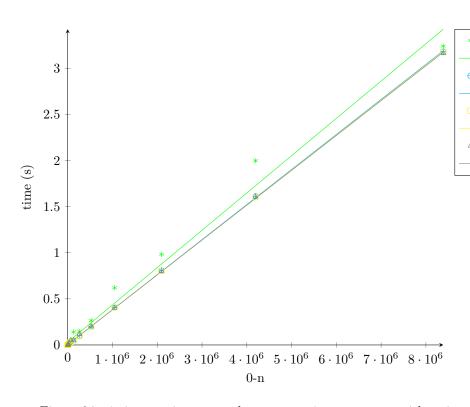


Figure 23: timing-rewrite-repeated-app-ssrrewrite

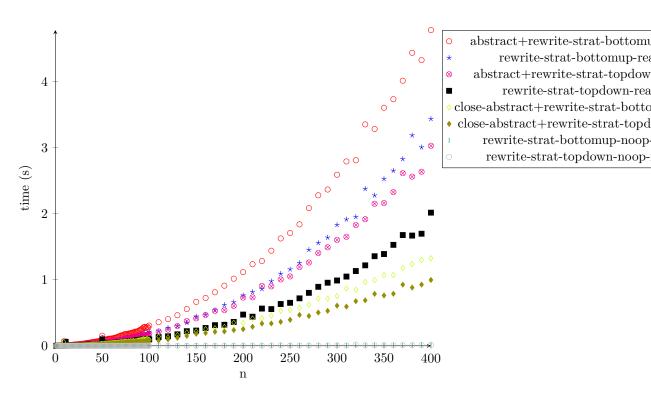


try-ssr-rewrite!-cold-noop-rea $4.05\cdot 10^{-7}\cdot x + 3\cdot 10^{-2}$ 

try-ssr-rewrite?-noop-real  $3.8\cdot 10^{-7}\cdot x + 1.88\cdot 10^{-3}$  try-ssr-rewrite-noop-real

 $\begin{aligned} &3.79\cdot 10^{-7}\cdot x + 1.62\cdot 10^{-3}\\ &\text{try-ssr-rewrite!-noop-real}\\ &3.78\cdot 10^{-7}\cdot x + 3.87\cdot 10^{-3} \end{aligned}$ 

Figure 24: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn  $\ 1$ 



rewrite-strat-bottomup-rea abstract + rewrite - strat - topdow

rewrite-strat-topdown-rea

rewrite-strat-bottomup-noop-

rewrite-strat-topdown-noop-

 ${\bf Figure~25:~timing\text{-}rewrite\text{-}repeated\text{-}app\text{-}rewrite\text{-}strat}$ 

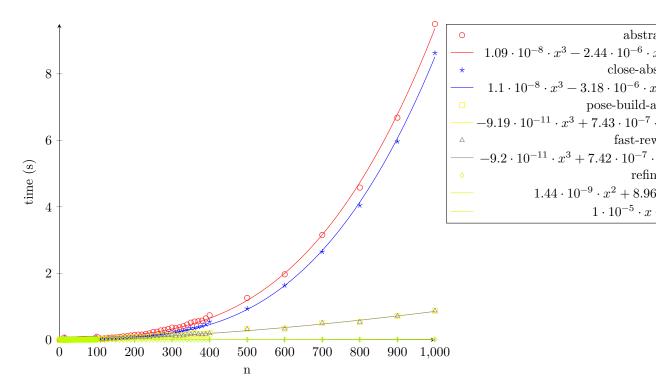


Figure 26: timing-rewrite-repeated-app-fast-rewrite

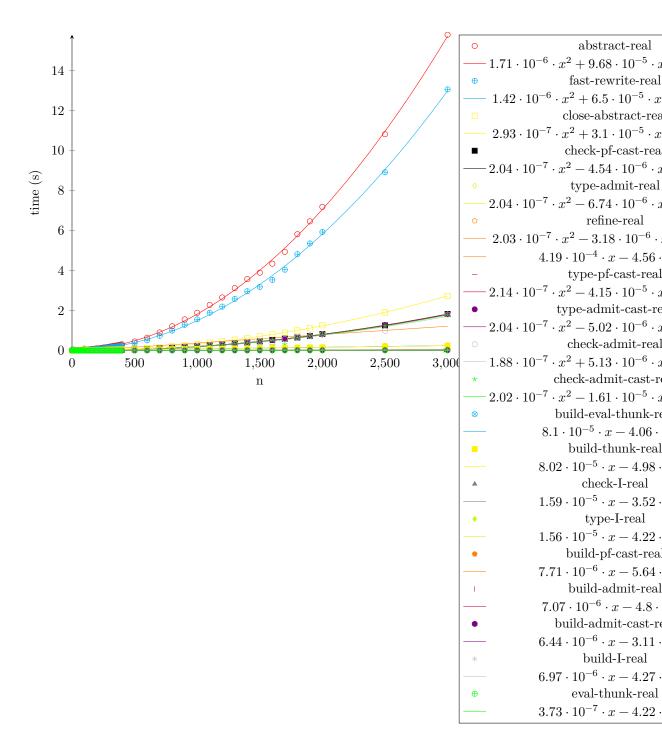
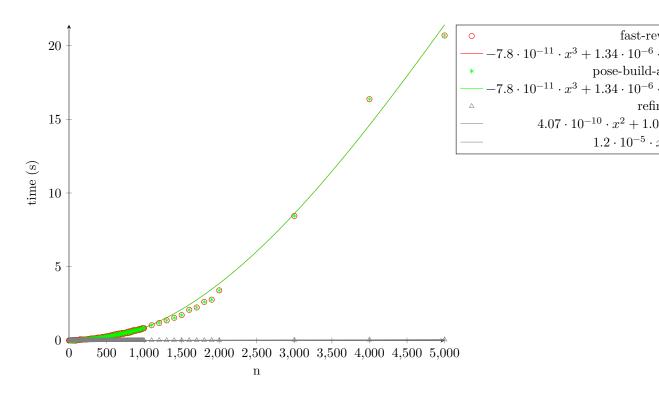


Figure 27: timing-rewrite-repeated-app-fast-rewrite-ltac2



 $Figure\ 28:\ timing-rewrite-repeated-app-fast-rewrite-no-abstract$ 

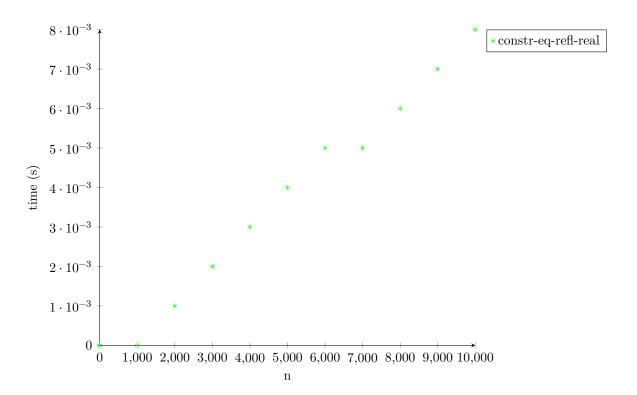


Figure 29: timing-constr-eq-alpha

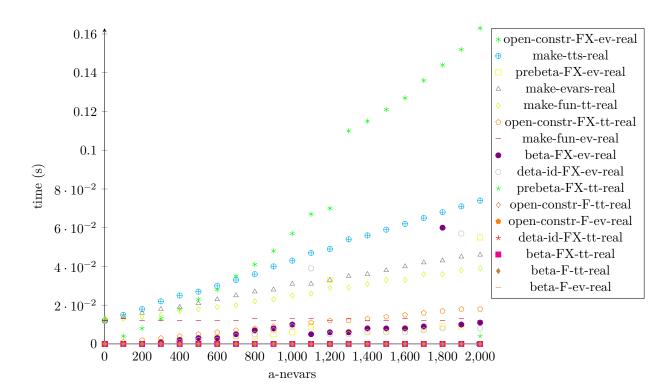


Figure 30: timing-lift-identity-evar-subst-nevars param-ctx-size  $\ 0,\ 1,\$ param-extra-binders  $\ 0,\ 1$ 

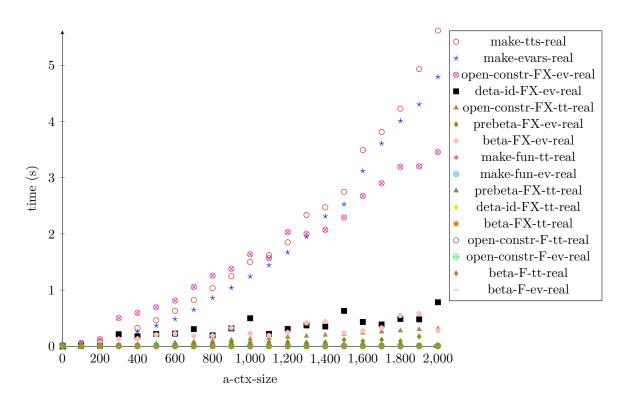


Figure 31: timing-lift-identity-evar-subst-ctx param-extra-binders  $\ 0, \ 1, \ param-nevars \ 0, \ 1$ 

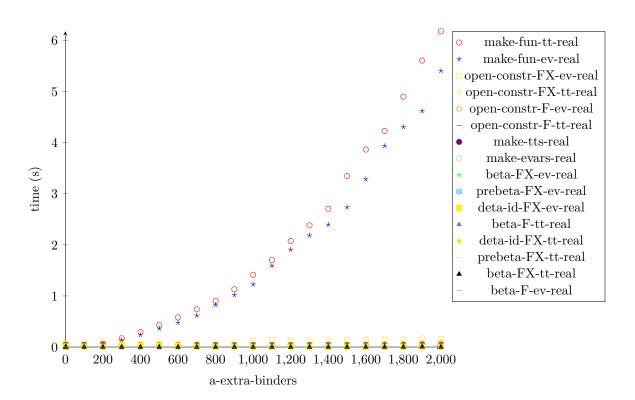


Figure 32: timing-lift-identity-evar-subst-binders param-ctx-size  $\ 0,\ 1,\ param-nevars\ 0,\ 1$ 

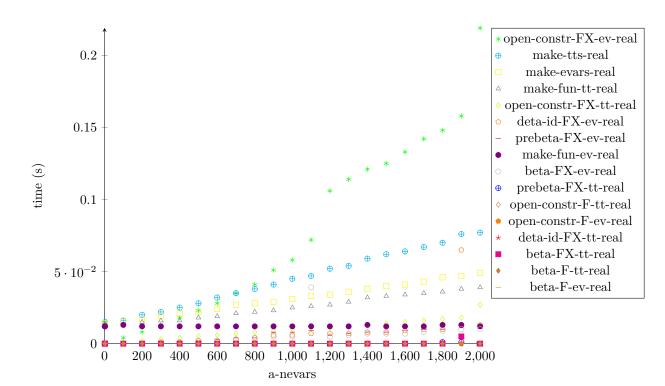


Figure 33: timing-lift-non-identity-evar-subst-nevars param-ctx-size  $0,\ 1,$  param-extra-binders  $0,\ 1$ 

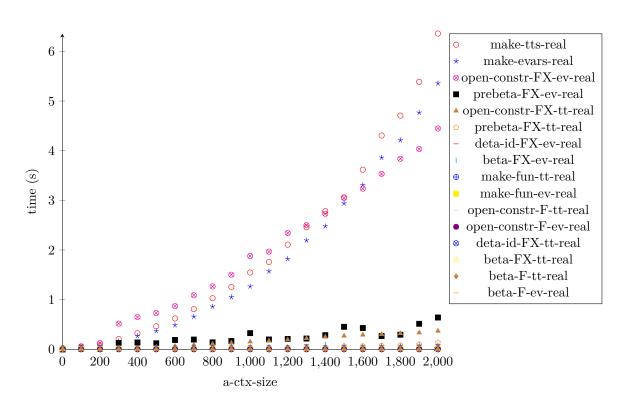


Figure 34: timing-lift-non-identity-evar-subst-ctx param-extra-binders 0, 1, param-nevars 0, 1

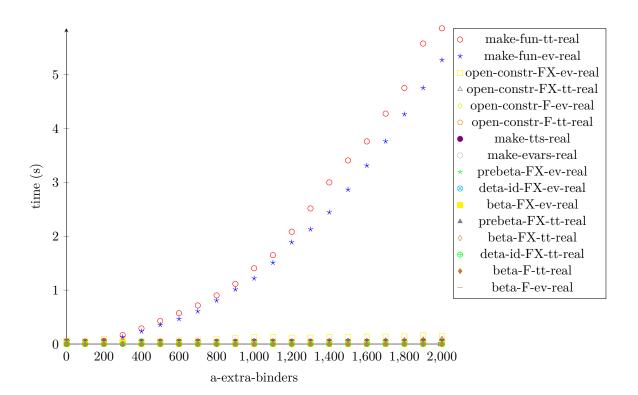


Figure 35: timing-lift-non-identity-evar-subst-binders param-ctx-size 0, 1, param-nevars 0, 1

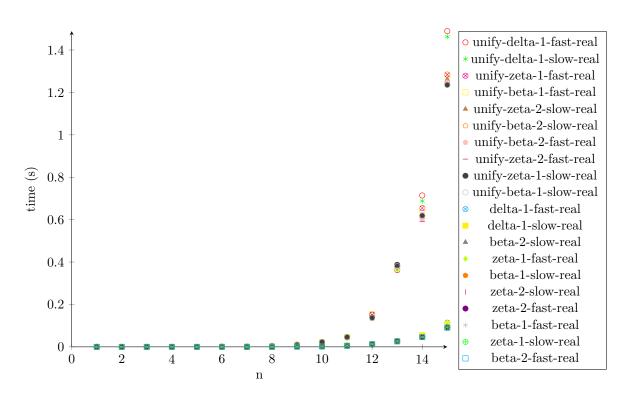


Figure 36: timing-one-step-reduction

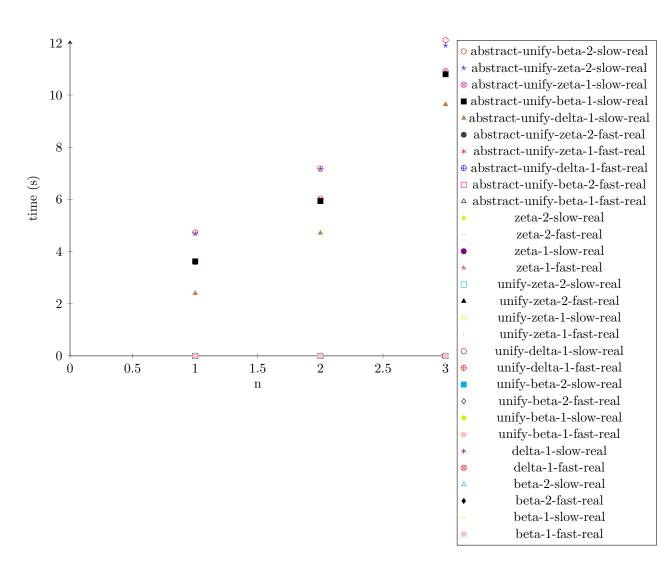


Figure 37: timing-one-step-reduction-with-abstract

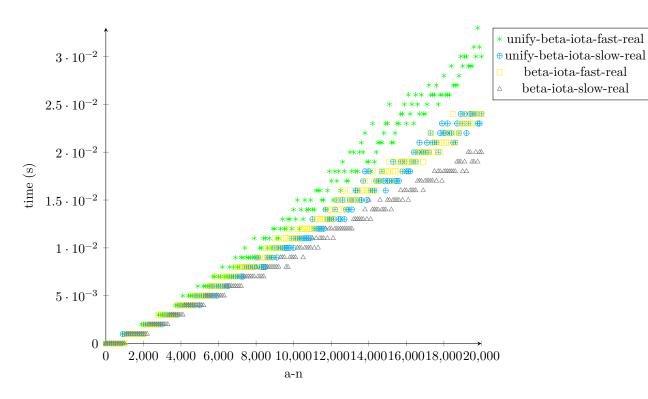


Figure 38: timing-iota-reduction-fact8 param-fact-n  $\,\,8\,$ 

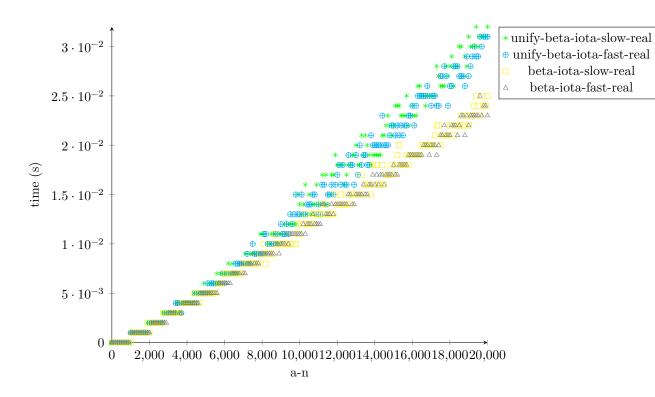


Figure 39: timing-iota-reduction-fact9 param-fact-n $\,\,9$ 

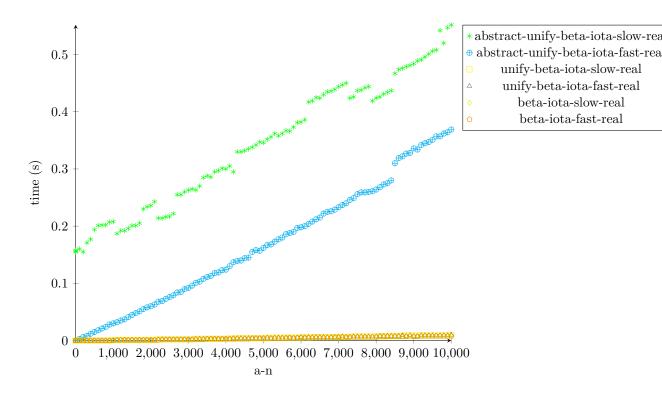


Figure 40: timing-iota-reduction-with-abstract-fact8 param-fact-n  $\,\,8\,$ 

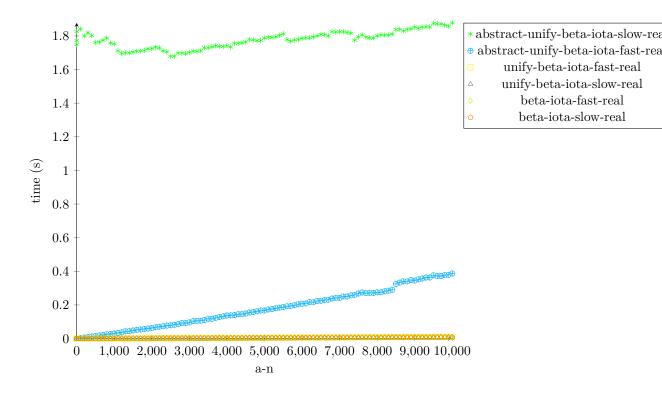


Figure 41: timing-iota-reduction-with-abstract-fact9 param-fact-n  $\ 9$ 

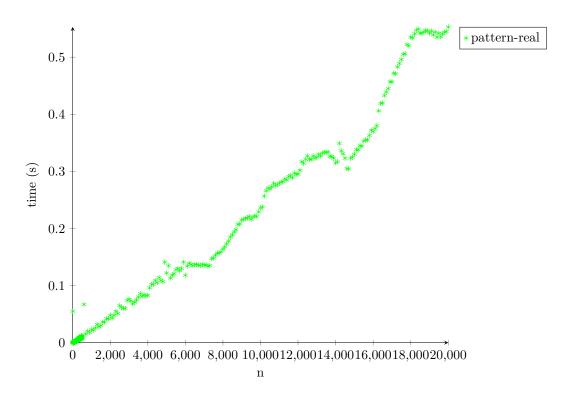


Figure 42: timing-pattern

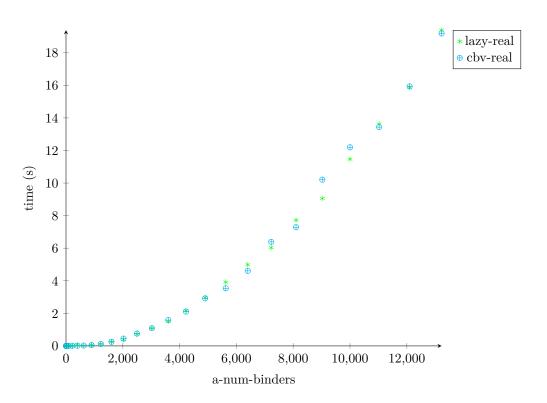


Figure 43: timing-quadratic-cbv-lazy-PHOAS param-n $\,\,0\,\,$ 

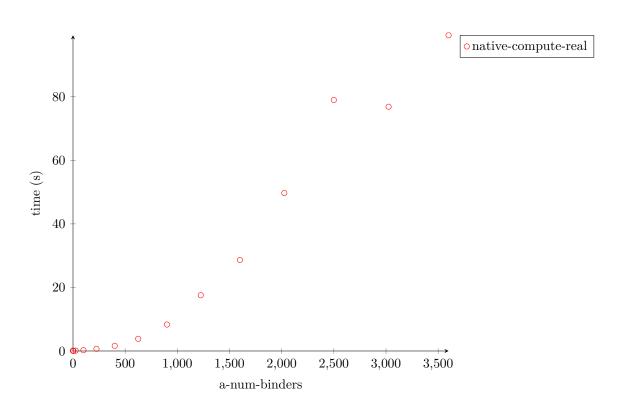


Figure 44: timing-quadratic-native-PHOAS param-n  $\,0\,$ 

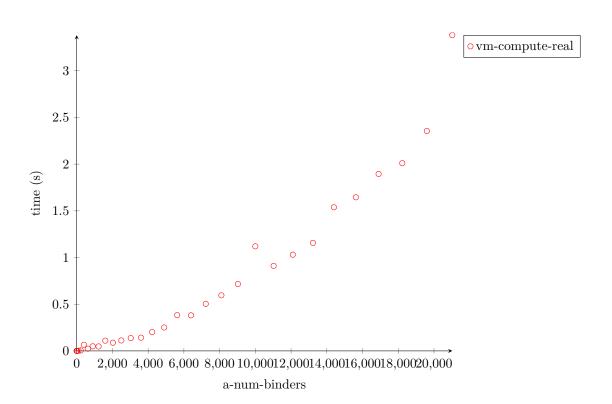


Figure 45: timing-quadratic-vm-PHOAS param-n  $\,0\,$