

Figure 1: timing-pattern

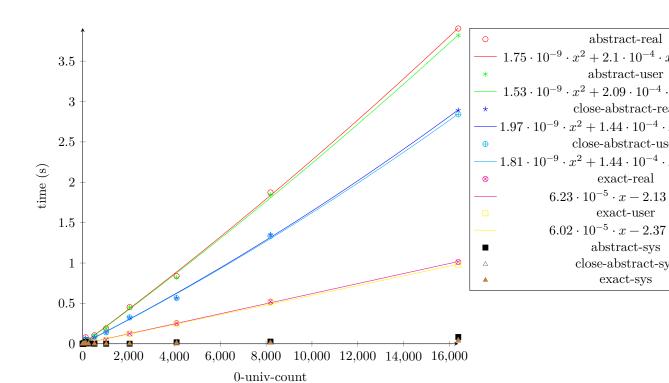


Figure 2: timing-n-polymorphic-universes param-1-n 0

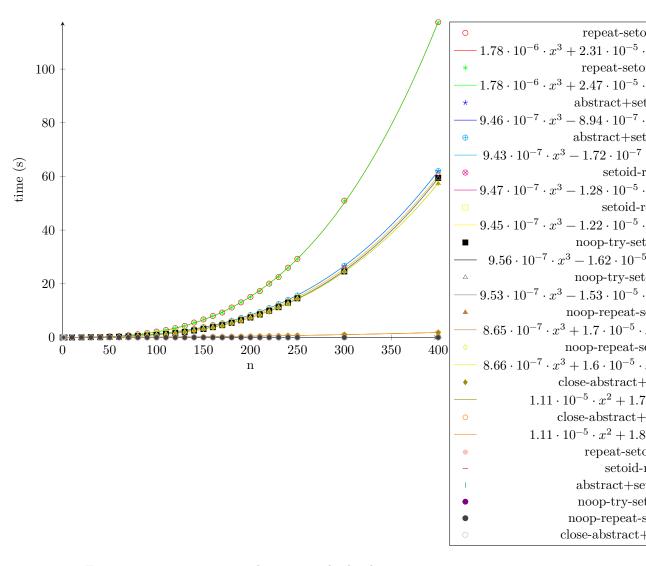


Figure 3: timing-repeat-setoid-rewrite-under-binders

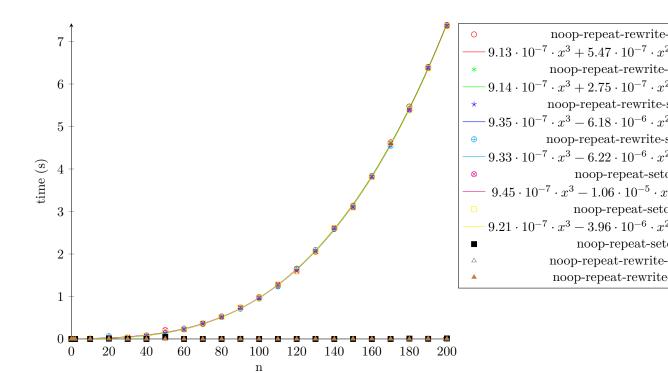


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

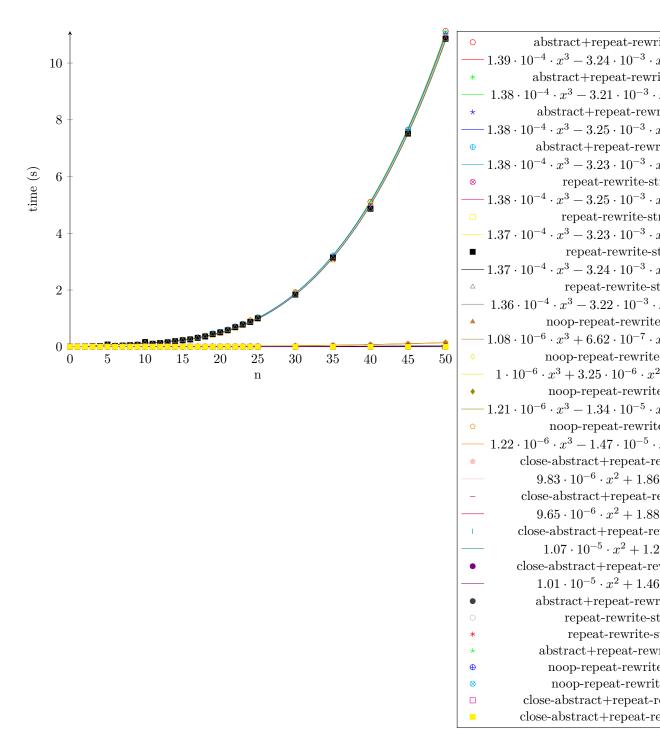


Figure 5: timing-rewrite-strat-under-binders

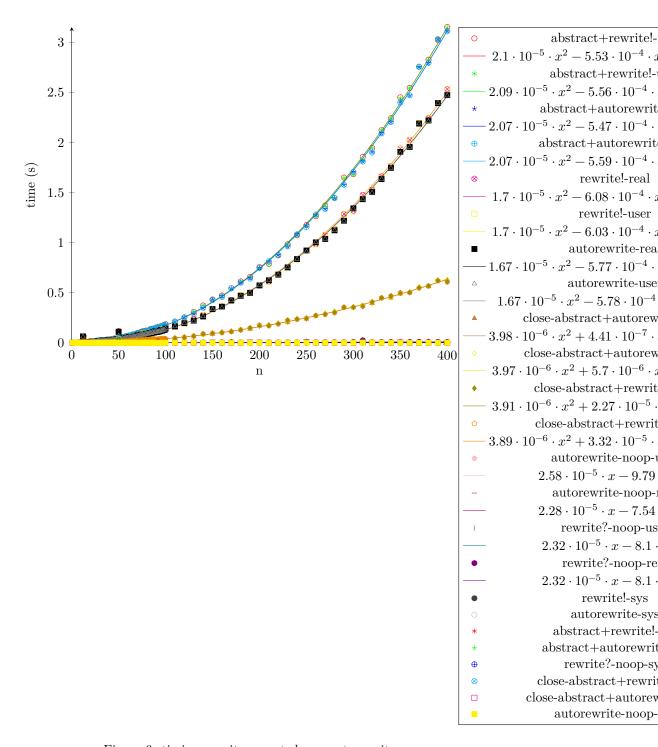


Figure 6: timing-rewrite-repeated-app-autorewrite

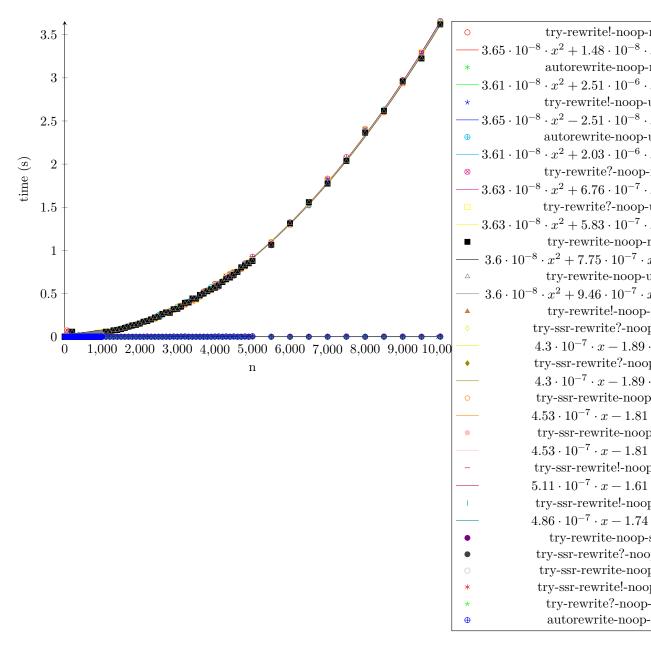


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

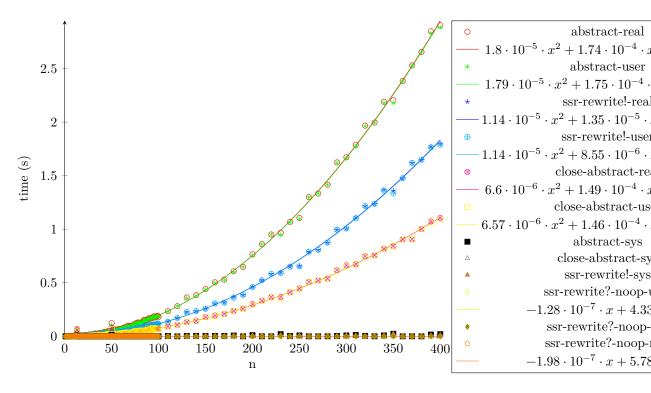


Figure 8: timing-rewrite-repeated-app-ssrrewrite

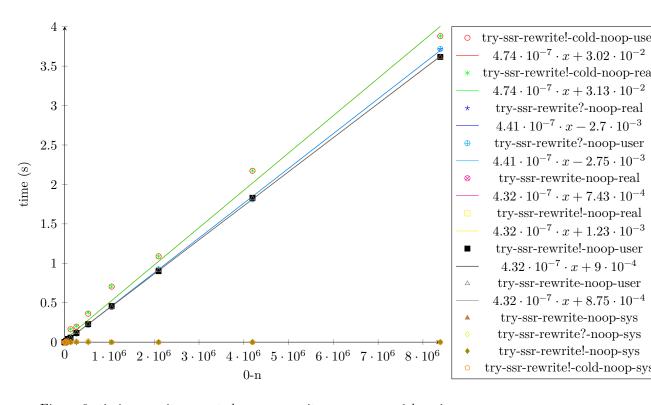


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\,1\,$

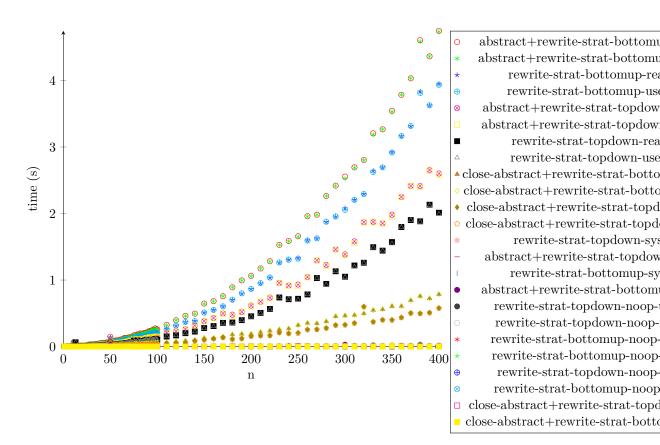


Figure 10: timing-rewrite-repeated-app-rewrite-strat

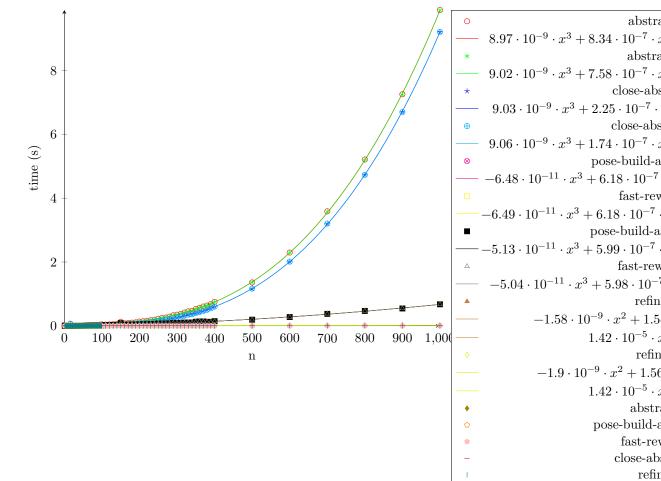
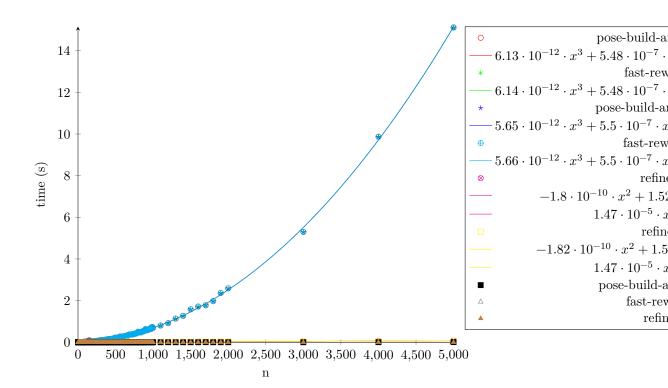
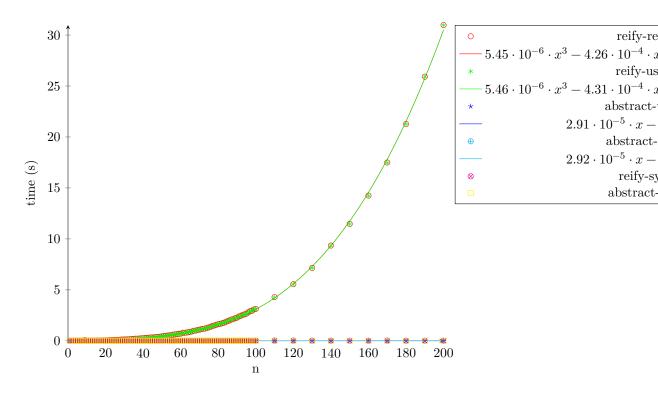


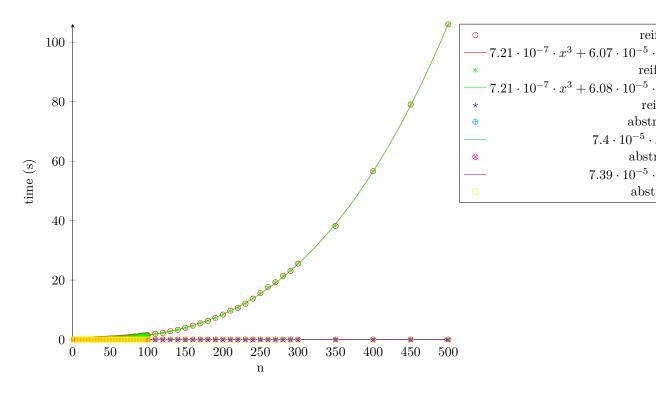
Figure 11: timing-rewrite-repeated-app-fast-rewrite



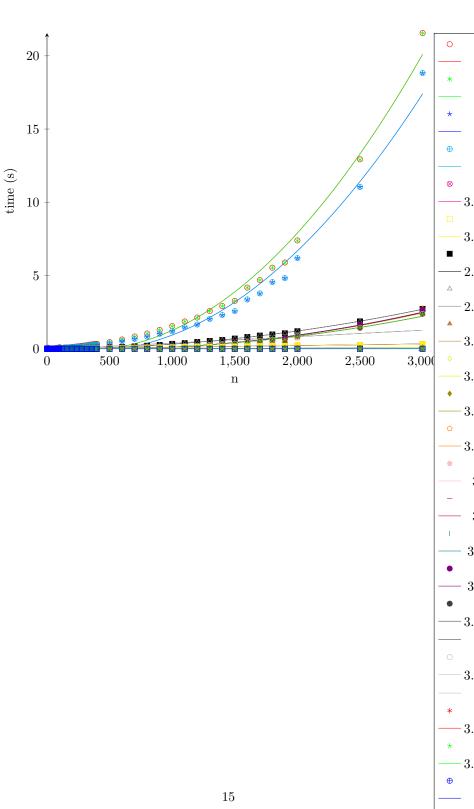
 $Figure~12:~timing\mbox{-rewrite-repeated-app-fast-rewrite-no-abstract}$



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



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



 $2.78 \cdot 10^{-6} \cdot x^2 - 1.69 \cdot 10^{-6}$ $2.78 \cdot 10^{-6} \cdot x^2 - 1.69 \cdot 10^{-6}$ $2.49 \cdot 10^{-6} \cdot x^2 - 1.71 \cdot 10^{-6}$ $2.49 \cdot 10^{-6} \cdot x^2 - 1.72 \cdot 10^{-6}$ $3.78 \cdot 10^{-7} \cdot x^2 - 3.06 \cdot 10^{-4} \cdot x^2$ $3.78 \cdot 10^{-7} \cdot x^2 - 3.06 \cdot 10^{-4} \cdot x^2$ $2.92 \cdot 10^{-7} \cdot x^2 + 2.54 \cdot 10^{-5} \cdot x^2$ $2.91 \cdot 10^{-7} \cdot x^2 + 2.59 \cdot 10^{-5} \cdot x^2 + 2.59 \cdot 10^{-5}$ $3.65 \cdot 10^{-7} \cdot x^2 - 2.87 \cdot 10^{-4} \cdot x^2$ $3.65 \cdot 10^{-7} \cdot x^2 - 2.87 \cdot 10^{-4} \cdot x^2$ $3.65 \cdot 10^{-7} \cdot x^2 - 2.85 \cdot 10^{-4} \cdot x^2$ $3.64 \cdot 10^{-7} \cdot x^2 - 2.84 \cdot 10^{-4} \cdot x^2$ $3.73 \cdot 10^{-7} \cdot x^2 - 3 \cdot 10^{-4} \cdot x$ $3.73 \cdot 10^{-7} \cdot x^2 - 3 \cdot 10^{-4} \cdot x$ $3.69 \cdot 10^{-7} \cdot x^2 - 2.83 \cdot 10^{-4}$ $3.69\cdot 10^{-7}\cdot x^2 - 2.83\cdot 10^{-4}\cdot \\$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.18 \cdot 10^{-4} \cdot x^2$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.18 \cdot 10^{-4} \cdot x^2$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.15 \cdot 10^{-4} \cdot x^2$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.15 \cdot 10^{-4} \cdot x^2$

 $abstract\text{-}\mathrm{real}$

abstract-user

fast-rewrite-real

fast-rewrite-user

type-admit-cast-re

type-admit-cast-us

close-abstract-rea

close-abstract-use

type-admit-user

type-admit-real

check-admit-cast-r

check-admit-cast-u

check-admit-real

check-admit-user

check-pf-cast-rea

check-pf-cast-use

refine-user

 $4.4 \cdot 10^{-4} \cdot x - 5.21 \cdot$ refine-real

 $4.4 \cdot 10^{-4} \cdot x - 5.21 \cdot$ type-pf-cast-real

type-pf-cast-user

build-eval-thunk-ua

build-thunk-real $1.09 \cdot 10^{-4} \cdot x - 7.41 \cdot$ oboole I man

 $1.1 \cdot 10^{-4} \cdot x - 8.57$