LOGO Graphics Tower Building f16=(λ (x) (f2 (* ϵ x) (- 2π f23=(λ (x) (for (λ (y z) (move (* ϵ y) (* ϵ x) z)))) f11=(\(\lambda\) (x y) (for y (\(\lambda\) (z u) (move 3 (reverse (for x (\(\lambda\) (v w) (move 6 (3x1 w))) u))))) (f15 x (f16 x u))))) $f15=(\lambda (x) (f2 (* \epsilon x) \epsilon))$ f10=(λ (x y z) (get/set (λ (u) (f4 z y u)) (f4 2 y x))) f7=(λ (x y) (move y 2π (f6 x))) f6=(pen-up (λ (x) (move 1 2π f10=(f2 ε ε) $f18=(\lambda (x) (f10 (f10 x)))$ $f5=(\lambda (x y) (for x (\lambda (z u) (move y (3x1 u)))))$ Symbolic Regression f12=(λ (x) (for x (λ (y z) (move 6 (get/set (λ (u) $f2=(\lambda (x y) (f0 x y))$ $f12=(\lambda (x y) (for 5 y x))$ f4=(λ (x y) (for y (λ (z u) (f3 (move 4 u) (λ (v) (reverse v)) x)))) $f13=(\lambda (x y z) (f12 y (\lambda (u v) (get/set x (f3 0 z v)))))$ $(f4 \ 2 \ x \ u)) \ z)))))$ $f3=(\lambda (x y z) (for z (\lambda (u v)))$ $f3=(\lambda (x y) (f2 x (/ 2\pi y)))$ (1x3 (move 4 (y v)))) (move 2 (3x1 x)))) $f2=(\lambda (x) (/. (/. REAL x) x))$ f9=(λ (x) (for x (λ (y z) (get/set (λ (u) (f6 u 5)) (f4 2 1 z))))) $f6=(\lambda (x) (f3 x (\lambda (y) (1x3 (reverse y)))))$ f5=(λ (x) (f2 ϵ (/ ϵ 2) x)) f4=(λ (x y) (for 7 (λ (z u) (get/set x (f1 (f3 0 3 $f4=(\lambda (x) (f0 (*. (f3 x) x)))$ $f0=(\lambda (x) (+. x REAL))$ f1=(f0 0 ε) $f7=(\lambda (x) (/. REAL (f0 x)))$ f0=(λ (x y z) (for z (λ (u v) (move x y v)))) f13=(\(\lambda\) (x) (for x (\(\lambda\) (y z) (f6 (reverse (move 4 z)) 5)))) f22=(λ (x) (for 5 (λ (y z) f11=(λ (x) (for 7 (λ (y z) (f0 (* ϵ x) ϵ 7 z)))) (get/set x (f1 8 z))))) $f1=(\lambda (x) (*. (+. REAL x))$ REAL)) $f3=(\lambda (x) (f0 (*. (f1 x) x)))$ $f6=(\lambda (x) (f3 (*. x (f3 x))))$ f24=(λ (x) (f5 (f9 0 (f5 x)))) $f19=(\lambda(x))$ (for $x(\lambda(yz))$) (f0 1) $f2=(\lambda (x) (for x (\lambda (y z) (move 6 (get/set (\lambda (u)$ (reverse (f1 y 1 u))) f1=(\(\lambda\) (x y) (for x (\(\lambda\) (z u) (move y (f0 (\(\lambda\) (v) (v (reverse u)))))))) f8=(/ 2π 4) $f9=(\lambda (x) (move (* 1 x) f8))$ f0=(λ (x) (1x3 (move 4 (1x3 (reverse (x (λ (y) (move 2 (3x1 y)))))))) $f7 = (\lambda (x) (for x (\lambda (y z)))$ $(get/set (\lambda (u)) (f1 y 4))$ $f20=(\lambda(x))$ (for $4(\lambda(yz))$ (f9 x f21=(move 1 f8) f8=(for 3 (λ (x y) (move 4 (f0 (λ (z) (z y)))))) $f14=(\lambda (x) (for x (\lambda (y z) (f9 y$ List Processing Text Editing $f14 = (\lambda (x) (map (\lambda (y) (if (x y) (+ y 1) 0))))$ $f13=(\lambda (x) (map (\lambda (y) (eq? (mod y x) 0))))$ f12=(λ (x y) (map (λ (z) (if (char-eq? z x) y z)))) f9=(λ (x y z) (fold (f3 z x) y (λ (u v) (cdr v)))) f11=(λ (x y) (map (λ (z) (index z x)) (range (y (+ f2=(λ (x y) (unfold x y (λ (z) (car z)) (λ (u) (cdr $f3=(\lambda (x y) (f2 x (\lambda (z) (char-eq? y (car z)))))$ f14=(λ (x) (f11 (f3 x SPACE))) f10=(λ (x y z) (f3 (f8 z x (cdr (f9 y x x))) y)) $f11=(\lambda (x) (f5 (cdr x)))$ $f9=(\lambda (x y) (fold x y (\lambda (z u)))$ $f5=(\lambda (x) (empty? (cdr (cdr x))))$ $f4=(\lambda (x) (f1 (f3 x SPACE)))$ $f8=(\lambda (x) (map (\lambda (y) (mod y)$ $f7 = (\lambda (x y))$ (if (fold (cdr x)) $f1 = (\lambda (x) (f0 x STRING))$ (f5 x) (\(\lambda\) (z) (y (\(\lambda\) (u) (char-eq? (if u '.' z) z))))) (f6 x) x)) $f2=(\lambda (x) (cdr (cdr x)))$ $f4=(\lambda (x y) (fold (f2 (f2 x)))$ y (λ (z u) (cdr (f3 u (car u)))))) f6=(f0 STRING) f19=(λ (x y z) (f8 z (cons x y))) $f3=(\lambda (x y) (fold x (cons y empty) (\lambda (z u) (cons z))$ $f0=(\lambda (x y) (fold y x (\lambda (z u)))$ $f18 = (\lambda (x y) (f9 y x (f17 x)))$ $f8=(\lambda (x y) (f0 (cons x y)))$ $f10=(\lambda (x y) (f5 x (\lambda (z)))$ f1=(+ 1 f0) f17=(λ (x) (f8 RPAREN empty (cons LPAREN x))) f0=(+ 1 (+ 1 1)) f20=(λ (x y) (f15 (f10 x y '.') x)) f5=(λ (x y) (fold x empty (λ (z u) (if (y z) (cons z u) f16=(λ (x y) (map (λ (z) (index z x)) (y (length (f15 x x))))) f15=(λ (x y) (f0 (f13 x '.') (f13 y '.'))) $f13=(\lambda (x y) (cons (car x))$ $f12=(\lambda (x y) (length (f5 x (\lambda x))))$ f7=(λ (x y) (f6 (f5 x (λ (z) (gt? y (length (f5 x (λ $f15=(\lambda (x) (gt? (mod x f0) 0))$ (u) (gt? z u))))))))) $f6=(\lambda (x) (car (f5 x (\lambda (y) (empty? (f5 x (\lambda (z) (gt?$ Scientific Laws Generative Text Patterns $f10=(\lambda (x))$ (fold x empty ($\lambda (y)$ z) (fold z y ($\lambda (u v)$) (zip z $y (\lambda (w a) (+. a w))))))))$ $f29=(\lambda (x) (r_l (r_l x)))$ $f4=(\lambda (x) (fold x 0. (\lambda (y z) (+. z y))))$ $f5=(\lambda (x y) (f4 (zip y x (\lambda (z u) (*. u z)))))$ $f28 = (\lambda (x) (r_d (r_d (r_d (r_d (r_d (r_d x))))))$ $f3=(\lambda (x y) (+. (*. y y) (*. x x)))$ $f23 = (\lambda (x) (r_u (r_u x)))$ $f26=(\lambda (x) (r_u (f23 x)))$ $f9=(\lambda (x y) (f1 pi (f2 (/. y x) 1.)))$ $f1 = (\lambda (x) (/. (+. x x)))$ f19=(λ (x y) (r_kleene y (r_dot (r_u x)))) $f2=(\lambda (x y) (power x (f0 (f1 y)))$ $f0=(\lambda (x) (/. 1. x))$ f12=(λ (x y z) (map (λ (u) (*. u (f8 y (f2 (f8 x x z) u) z))) $\overbrace{f8=(\lambda (x) (r_u (r_d (r_d (x)))))}$ f9=(λ (x) (f8 (r_d (r_d x)))) f6=(λ (x y) (x (fold y 0. (λ (z u) (+. u (*. z z)))))) $\overbrace{f6=(\lambda (x) (r_d (string_0 \\ x)))}$ f11=(λ (x y z u) (+. (*. u y) (+. (f7 z (cons u empty)) $f7 = (\lambda (x y) (/. (f6 (\lambda (z) (*. (*. (x x) z)) y) (+. x x)))$ $f10=(\lambda (x) (f4 (r_d (r_d$ $f11 = (\lambda (x) (f10 (r_d x)))$ $f4=(\lambda (x) (r_const (r_d (r_d x))))$ $f27=(\lambda (x) (f5 (string_period x)))$ $f5=(\lambda (x) (f4 (f0 x)))$ **Basic Recursive Functions** $f2 = (\lambda (x) (f1 (r_d x)))$ $f3 = (\lambda (x) (f2 (r_d x)))$ f1=(λ (x y) (f0 x (λ (z u) (if (y u) z (cons u z))) empty)) $f7=(\lambda (x) (f1 (r_const (r_d x))))$ $f16=(\lambda (x) (r_u (f1 x)))$ f5=(λ (x y) (f0 x (λ (z u) (cons (y u) z)) empty)) $f1=(r_{kleene} (\lambda (x) (f0) (r_{dot x))))$ f0=(λ (x y z) (fix1 x (λ (u v) (if (empty? v) z (y (u (cdr v)) (car v)))))) f18=(λ (x) (f1 (r_d (string_period x)))) $f9 = (\lambda (x) (f0 x (\lambda (y z) (+ y 1)) 0))$ $f7=(\lambda (x) (f2 (\lambda (y) (x y)) (\lambda$ $f14=(\lambda (x y) (f1 (r_kleene y)$ f2=(\(\lambda\) (x y z u) (fix1 u (\(\lambda\) (v w) (if (z w) empty (cons (y w) (v (x w)))))) $f15 = (\lambda (x) (f14 x (\lambda (y) (f0 (r_const y)))))$ f8=(λ (x y) (car (f0 (f6 y) (λ (z u) (cdr z)) x))) $f6=(\lambda (x)) (f4 (\lambda (y))) (eq?)$ $f4=(\lambda (x) (f3 (\lambda (y) y) x 0))$ $f3 = (\lambda (x y) (f2 (\lambda (z) (+ z 1))$ $x (\lambda (u) (y u))))$ $f0=(r_kleene(\lambda(x)(r_d))$ $f10=(\lambda (x) (f3 (\lambda (y) (-x y)) (\lambda (z) (eq? z 0))))$ $f22=(\lambda (x) (f20 (f21 x)))$ $f20=(\lambda (x) (r_const (f0 x)))$ $f24=(\lambda (x))$ (string_underscore (f0 x))) f25=(λ (x) (f20 (f17 (f21 (f17 x))))) $f21=(\lambda (x) (f12 (f12 x)))$ f13=(r_kleene (λ (x) (f12 $f12 = (\lambda (x) (r_u (f0 x)))$ f17=(r_kleene (λ (x) (r_u Solved 0.9 0.9 8.0 LOGO 0.7 Regression Text 0.6 0.6 Towers % Testing Full model No Rec 0.3 -0.3 -1.50 1.75 2.00 2.25 2.50 6 12 18 24 30 36 42 48 54 Maximum library depth Average library depth Library size