## han H1. F0. DO OK & H108 €:

BNF :1 asice א. נכטוב את הדק פוק LLEZ = = LATOM> 0 12List> LList>:= Nall (3) (list 2LES ...) (append Lhists...) (cons LLE) LLists) 6 LATOM>=:= LNum> (7) 125ym> ב הראה כיצד נשלחת שלוע התולות הבאותב 1) 5233 LLED D> LATOM> D> LNum) مرارام عن عن عن عن المرارام عن المرارام المرارام عن المرارام ال 2) (list 1 (cons 'Ewo null) (append (append) (list))) LLES @>(Llists) @>(Ilist> LLE> LLE> LLE>) Dy ( list > < Num > LLE> LLE>) S(list > 1 Nam > (cons 2) E> 22ist> )21E>) @>( list t> INUm> (cons LATOM> LLists) 21 =>) By bist > LNum> (cons'25,m) LLists) LLES) 3> ( list t > LNUMS (cons Lsyms null) 21EX) => ( list > I Num> (cons Lsym > hall) 2 List) E> (list , Nom > (cons \zsym>"null) (append 2List) LList>)) E) (list INam > ((ons' 15) ms nall) (append (append) LListx)) ( list L Num > ( cous Lsym > null)

(append (append) (list))

AUMIN SO => (list 1 (cons two nav) (append (append) (bist)))

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3) (cons 1 (cons (append (cons x null) (list //2)) null)
     LLES => 2 List>
        @> (cons LLE) LLists)
        => ( (ONS LATOM> 2 Lists)
        => (cons 2 Nam> 2 ists)
       E> (cong I Num> (cons LLE> Lists))
      (cons 2 Nam) (cons 2 List > 2 List >)
       By (cons INam) (cons (append List) List))
      (cons 2 Num> (cons (append (cons LLE > List>)) ~ Lists))
      => (cons 2 Num> (cons (append
                        (cons LATOM > List>)) LList>)
     B) ((ons 1 Num) (cons (append
                      (cons 2sym> 2List>)
     3>(consinum> (cons (aproend
                   (cons > Lsym> null) LList>) LList>))
     97 (cons 2 Nums (cons Cappend
                 (cons ) Lsym> null) (list 2/12 2/12) (List2))
  (cons & Num (cons cappend
             (considerms null) (list 2 Atom> LATOMS) 22ister)
     2) (cons 2 Num> (cons (append
             (cons'Lsym> null). (list'Lsym> ) LList>))
     Extrons 2 Num> (cons (append (cons >25xm>null)
                            (list 1257m> 'LSym>) null)
Cons (cons (cons (cons /x null)
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(list 1x 12)) null)

ארקטוישו ביביטוי שהוא אוד פונהניה 'רזעה' - אור שיהיו מעתניב חופטים מופטים ביביטוי שהוא אוד בונהניה 'רזעה' - אבי

שבתובל ההחלב שבער היה לכל לינתי את העונו ב- חליוט לי שימוני בבעיני (ב) (- מול כצל זב במול הסלחת בתור (בסבימות ליותו את או אוער בעובל ההחלפות בתור (בסבימות את אובל ההחלפות

## FLANG :3 78Ke

· (Call (Call (fun X

נמן הקוך השוי.

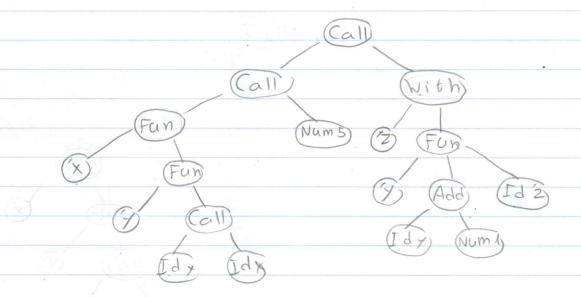
(Fun y ((all (Idy) (Id x))))
(Num 5))

( With z

(fun y (Add (fdy) (Numi)))

(fdz)))

א כתבו את הקוד בשפר שלנו אשר אותו נתאר אל התחפר האבס לתף



(run" \( \tau \) \( \t

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((all (Call (Fun X
                       (Fun y (call ([dy)([dx)])) Nums))
                      (With z
                       (Fun y (Add (Idy) (Num 1)))
                          (((2 PI))
                                   fun.
        Asty: (Call (Call (Fun x (Fun x (Gall (Idx)))) (Num 5))
10
                       (with z (fun y (Add (Edy) (Numa))) (Id z)))
        ENVy: (EmptyEnV)
        RETY: Numv 6
  a. a. AST; (call (Fun x (Fun y (call (Idx) (Id x))) (Nums))
         ENV2: (EmptEnV)
      >> RETa:
      i. Astz: (Fun X (Fun y ((all (Idx)(Idx))))
        ENV3: (EMPTENV)
       - RET3: (Fun V *(fun y ((all (Idx) (Idx))) (EmptyEnv))
      11 AST4: Num 5
        ENVy: (Empt EnV)
         BETH: NumV 5
      iii AST 5: Fun y ( (all ( [dx) ( [dx)
        ENVE: (Extend X (NumV S) (Emptz EnV))
        RETE: (FUNV $ (call (Idy)(Idx)) (Extend & (NumV 5) (EmptyEnV)
        ASTG: (With & (funy (Add (Idy) (Numa))) (Idz))
        ENUG: (Extend & (Numv 5) (Empty Env))
       12 ITG: Mumb
     Num 8
```

i AST7: FUNY (Add (Idy) (Num N)) ENV4: (Extend X (NUMV 5) (EMOGYENV)) BETT: (FUNVY (Add (Idy) (NUM1)) (Extend & (NUMV5) (EmptyEnV) il ASTB. Id Z 7 401 RETG INV8: (Extend z (Funv y (Add (Idy) (Num)) (Extend x (NumV 5) (Empty En V))) (Extend x (Num 5) (Emoty EnV)) RETE: (FUNV y (Add (Idy) (Num1)) (Extend x (Numv5) (EmotrEn) C. , ASTq: (Call (Idy) (Idx)) ENVq: (Extend y (Funv y (Add (Idy) (Num1))) (Extend x (Numv 5) (EmotEnv) (Extend 'x (NumV 5) (EmptyEnV) RZIG: Nam 6 i ASTIO: Idy ENVIO: (Extend y (funv y (Add (Idy) (Num 1))) (Extend x (Numv5) (Emts) (Extend x (NUMY 5) (Empty INV) RETID (FUNNY (Add (Idy) (NUM1)) (Extend x (NUMV 5) (EMPTY IN 11 ASTITI Id X ENVII. INVIO 12 ETM: NUMV 5 Fil ASTID = (Add (Idy) ( NUM 1) ENVIZ: (Extend y (Nam V5) Extend x (Num U5) (Empty En V) RETIZ - Num 16 1) AST13 = Idx 2) ASTH: NUM 1 ENVIS: ENVI INVH: INVIZ 12 ETIZ: NamV 5 RETH: NUMV 7

```
WAE noun nann :4 noice
                               א הנוסיטו את הקוד הנדרט
Cdefine-troe VAE
 IAdd (LIST OF WAE) ]
 I Sub WAE (List of WAE) ]
IMU (LISTOF WAE) ?
[DIV WAE (Listof WAE)]
             ב תום את הקוד הנקרות א-פונקצות אב במוקצות ב
(: Parse-sexpr: Sexpr -> VAE)
   [ (list 12 (sexpr: args)...)
       (Add (DOISE-SEXDI aTRS)) ?
  [ (list '- fst (sexpr: args) ... ) (Sub (parse-sexpr fst)
                                     ( Darse-Sexpl ales))]
  [(list /* (sexpr: args)...) (Mul (parse-sexprargs))]
  [(list') fst (sexps: arps) ...) (Div (parse-sexpr fst)
                                  (parse-sexpit oves)]
C. SUBST WAE SYMBOL WAE-DUAE SUBST PIPS MOID X
[(Add args) (Add (subst args from to))?
[(Sub fst args) (Sub (Subst fst from to)
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[(Mul ares) (Mul (subst ares from to)]

[(Div fst args) (Div (subst fst from to)

(subst\* ares from to)]

(subst args from to)

AST8: Id 2

ENV8: (Extend 2 (Fun) & (Add (Fdy) (Num 1) Extend &

(call (Idx) (Idx) (Extend & (NumV 5)) (Empty Inv

RETS: (Funv 1) (Add (Edy) (Num 1)), ENVZ

ASTq: (Call (Idx) (Idx))

ENVq: Extend &

1

דם הוספה שקור הנפרט ל-eval-f

(:eval:WAE->Number

0

[(Add args) (fold) + o (eval args))]

[(Sub fst args) (fold) - (eval fst) (eval args)

[(Mul args) (fold) × 1 (eval args)

[(Div fst args) (arith-9/(eval fst) (eval (mul args))]