YOOL for Windows Ver.1.01

,P口D **ŠT—v**
,Q口D **LISP,ÌŠî'b'mŽ¯**
,R口D **fΙfufWfFfNfgŽwŒü,ÌŠî'b'mŽ¯**
,S口D **Šî–{'€□ì**
,T口D **'g,Ý□ž,ŸŠÖ□"**
,U口D **□ìŽÒ□Ð‰î**
,V口D **fo□[fWf‡f"□î•ñ**

YOOL for Windows,ÍftfŠ□[fEfFfA,Å,·□Bfvf□fOf‰f€,ð•Ï□X,µ,È,¢ŒÀ,è
,Í"Ð•z,ÍŽ©—R,Å,·□B,Ü,½□A–{fc□[f‹,Å"®□ì,·,éfAfvfŠfP□[fVf‡f",É,Â
,¢,Ä,à"Ð•z,ÍŽ©—R,Å,·□B,µ,©,µ□A–{fc□[f‹,ÉfofO,ª—L,Å,½,Æ,µ,Ä,à□A
□ìŽÒ,Í,»,ê,ð□C□³,·,é‹`–±,Í•‰,¢,Ü,¹,ñ□B
,È,¨□A–{fc□[f‹,ðŽg—p,µ,½,½,ß,É"□¶,·,é□A,¢,©,È,é•s—˜‰v,â'¹ŠQ
,È,Ç,É‘Î,µ,à□Aˆê□Ø,ì□Ó"C,Í•‰,¢,©,È,Ü,·,ì,Å,²—¹□³Šè,¢,Ü,·□B

YOOL,ÌŠT—v

<u>EYOOL,Æ,Í H</u>
<u>EYOOL for Windows,Ì"o ê</u>
<u>EYOOL for Windows,Ì"Á'¥</u>
<u>EŠJ"ŠÂ‹«</u>

EYOOL,Æ,ÍH

YOOL,Í AYuji's Object Oriented Lisp,Ì—ª,Å–¼'O,Ì,Æ,¨,è
flfufWfFfNfgŽwŒü,ðfTf| fg,µ,½LISPŒ¾êê,Å,· B
fx [fX,Æ,È,éLISPfCf"f^fvfŠf^,Í A1986"N2ŒŽ,É'åŠw,Ì'²‹Æ
Œ¤‹†,Å ì¬,µ,½,Ì,ª Å‰,Å,· B,»,ÌŒã A E,µX68000,ð"ƒ,¢ A
68000,ÌfAfZf"fuf‰,Å ì¬,µ,½,Ì,ªYOOL,Å,· B
YOOL,Í1989"N5ŒŽ ,ÉŠJ",ðŠJŽn,µ A–ñ,Pf–ŒŽ,Å^ê‰ž"® ì,·,é
,æ,¤,É,è A1991"N12ŒŽ,Ü,Å,É ,µ,¸,Â'g,Ý ž,ÝŠÖ ",ð'Ç‰Á
,µ A,Â,é,Í48frfbfgŒÅ'è ¬ ""¯‰‰ŽZ‹@",\,âfRf"fpfCf‹‹@",\
,ðŽ ,Â ,'¬LISP ^— Œn,Æ,È,è,Ū,µ,½ B–Žžftfй [,Å—¬,ê,Ä,¢
,½XLISP,Æ"äŠr,·,é,Æ fAfCf"f^fvfŠf^,Å3'`4" AfRf"fpfCf‰,Å
,Í7'`10" ,''¬,Å,µ,½ BŽQ l,Ì,½,ß,ÉX68000,Å,Ìfxf'f}́ [fN
fefXfg,ÌŒ‹‰Ê,ðŽŸ,ÉŽ¦,µ,Ü,· B

ŽÀ sŠÂ‹«FX68000 ACE(68000 10MHz) f f,fŠ6MB

ŽÀ sŠÖ "	fCf"f^fvfŠf^	fRf"fpfCf‰
(nqueen 8)	49.2•b	19.2•b
(tarai 8 4 0)	10.6•b	2.9•b
(fibn 20)	16.4•b	6.0•b
(ac 3 5)	32.6•b	9.8•b

,»,µ,Ä A1991"N11ŒŽ10"ú A'æ,P‰ñ'S"ú–{X68000Œ| p Õ‹ß'E'n‹æ
'å‰ï,Åf}fCfRf" Ü,ðŽæ,è,Ü,µ,½ª A,»,ÌŒãŒöŠJ,³,ê,é,±,Æ,Í,È
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EYOOL for Windows,Ì"oê

Œ»ÝAŽ„ÍDOS/Vf}fVf",ÅWindows95,ðffCf",ÉŽg,Á,Ä,¢,é,Ì,Å
,·,ªAWindows95,É,È,Á,ÄŠ®'S,É32bit‰»,³,ê,â,Á,ÆLISPˆ—Œn
,ð"®ì,³,¹,éŠÂ‹«,ª®,¢,Ü,µ,½B,Ü,½AWindows95,Å, ,évf
fOf‰f€,ðì¬,·,é,Æ,«i"à—e,Í,Ü,¾"é–§,Å,·jAfIfufWfFfNfg
ŽwŒü,ÆfŠfXfgˆ—,ª•K{,Æ,È,Á,½,½,ßA1997"N10ŒŽ,©,çYOOL,ð
,bŒ¾Œê,Å‹L q,µ'¼,µA11ŒŽ,ÉWindows95,É"®ì,·,é,æ,¤,É,È,è
,Ü,µ,½B,»,ê,ªAYOOL for Windows,Å,·B

EYOOL for Windows,Ì"Á'¥

LISPˆ—Œn,ÌŽd—l
    (1)LISP1.9,ÆXLISP,âCommon LISP,Ì'†ŠÔ,Ì,æ,¤,ÈŽd—l,Å,·B
    X68000"Å,ÍLISP1.9Žd—l,Åì¬,µ,Ä,¢,½,Ì,Å,·,ªAWindows"Å
    ,ÍCommon LISP,É‹ß,Ã,¯,Ü,µ,½B,Å,àŠ®'S,É,ÍCommon LISP,É
    ,·,é,±,Æ,Í,Å,«,Ä,¢,Ü,¹,ñB¡Œã,Í,æ,èCommon LISP,É‹ß,Ã,¯
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    (2)Šî–{ŠÖ",Í"¯,¶–¼‘O,Å‹@"\,ªˆÙ,È,é,à,Í,ÍXLISP,âCommon LISP
    ,É‡,í,¹,é,æ,¤,É,µ,Ä,¢,Ü,·B
    (3)ˆê•",ÌŠÖ",Í‘A'g,Ý'ž,ÝŠÖ",Æ,µ,Ä,Å,í,È,"auto.yo",Å'è‹`
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    (4)ƒXƒ^ƒbƒN,ª[,¢,Å,A,P,O,O,O,O‰ñ'ö"x,Ì‹Ä‹AŒÄ,Ño,µ,à‰Â"\
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    (5)‹N"®Žž,Í,È,¢ƒ,ƒŠ,µ,©Á"ï,¹,A'å,«,ÈƒvƒƒOƒf€,ðŽÀs
    ,·,é,ÆŽ©"®"I,É,æ,è'½,,Ìƒ,ƒŠ,ðŠm•Û,µ,Ü,·B,æ,Á,ÄAƒf€ƒ,
    ƒŠ,ÌŽg—pŒø—¦,ª—Ç,¢,Å,·B

ƒIƒuƒWƒFƒNƒgŽwŒüƒvƒƒOƒf‰f~ƒ"ƒO,ÌŽd—l
    (1)ƒIƒuƒWƒFƒNƒgŽwŒü•"•ª,ÍŠ®‘SƒIƒŠƒWƒiƒ‹,Å,·B
    ƒIƒuƒWƒFƒNƒgŽwŒü•"•ª,ÍXLISP,Æ,àCLOS(Common Lisp Object
    System),Æ,àˆÙ,È,è,Ü,·B
    (2)Œp³(inheritance),Í‰Â"\,Å,·,ªA'½dŒp³,ÍƒTƒ|[ƒg,µ,Ä
    ,¢,Ü,¹,ñB
    (3)ƒNƒ‰ƒX•Ï",ÆƒCƒ"ƒXƒ^ƒ"ƒX•Ï",ðƒTƒ|[ƒg,µA"set",â"setq"
    ,â"setf",Å‘ã"ü‰Â"\B

,»,Ì'¼,ÌŽd—l
    (1)Windows95,ÅGUI,ðŽg,Á,½ƒvƒƒOƒf€,ð‘ì¬,Å,«,éB
    (2)‘å10ŒÂ,Ü,Å,ÌƒEƒCƒ"ƒh,ð§Œä‰Â"\B
    (3)32bitƒAƒvƒŠƒP[ƒVƒ"",È,Ì,Å"äŠr"I,‘¬,Å, ,éB

⬜EŠJ"Œ¾Œê

    Borland C++ 4.5J

⬜EŽQ⬜l•¶Œ£

    LISP"ü–å⬜@"⬜s⬜F"|•—ŠÙ
    Windows3.1ƒOƒ‰ƒtƒBƒbƒNƒvƒ⬜ƒOƒ‰ƒ~ƒ"ƒO⬜@"⬜s⬜F(Š")ƒCƒ"ƒvƒŒƒX
    WINDOWS WISDOM C/C++,É,æ,éWindowsƒvƒ⬜ƒOƒ‰ƒ~ƒ"ƒO"ü–å
            "⬜s⬜F‹Z⬜p•]˜_ŽÐ
    XLISP Version 2.1   ⬜ìŽÒ⬜FDavid Michael Betz
    GNU"Å Kyoto Common Lisp

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　　□º˜a40"N(1965)10ŒŽ7"ú
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　　–^"d‹Cƒ□□[ƒJ,ÌƒVƒXƒeƒ€ƒGƒ"ƒWƒjƒA,Å□ALSI□ÝŒv,ð□s,Á,Ä,¢,é□B
ƒ□□[ƒ‹ƒAƒhƒŒƒX
　　Nifty-Serve:HGE00744
　　Internet:HGE00744@nifty.ne.jp

ƒo[ƒWƒ‡ƒ“î•ñ

Ver.1.00　　ì¬F1998'3/14　　ŒöŠJF1998'3/21
　　ŒöŠJ,³,ê,½Å‰,Ìƒo[ƒWƒ‡ƒ“
Ver.1.01　　ì¬F1998'10/9
　　princ,Ì•\Ž¦,Ì³,ê•û,ð•ÏX B
　　s2I,Å•¶Žš—ñ,ðŠÜ,Þê‡,É³,µ,ƒŠƒXƒg,É•ÏŠ·,Å«,È,¢“_,ð
　　C³ B
　　freadc,fwritec,ª³,µ“® ,ì,µ,È,©,Á,½,Ì,ÅC³ B

LISP‚ÌŠî‘b‚mŽ¯

‰ELISP‚ª^µ‚¦‚éff‚[ƒ^‚ÌŽí—Þ
ƒAƒgƒ€‚FŠÖ‚”‚â•Ï‚”‚â’è‚”‚È‚Ç‚ð•\‚·–¼‘O(identifier)‚Æ
‚”Žš(number)‚A•¶Žš—ñ(string)‚ð‘‚‚Ì‚µ‚ÄƒAƒgƒ€‚Æ
Œ‚Ä‚Ñ‚Ü‚·‚B

    –¼‘O‚FŠÖ‚”‚â•Ï‚”‚â’è‚”‚È‚Ç‚ð•\‚·‚à‚Ì‚B‚u"‚v‚Æ
        ‚u(‚v‚Æ‚u)‚v^ÈŠO‚Ì‹L†‚^‚”Žš‚^ƒAƒ‹ƒtƒ@ƒxƒbƒg
        ‚©‚çŽn‚Ü‚è‚A‚”Žš‚Å‚È‚¢‚à‚Ì‚Í‘S‚Ä–¼‘O‚Æ‚µ‚Ä^µ
        ‚í‚ê‚Ü‚·‚B
        —á‚DABC   12AB   !#$%&'
    ‚”Žš‚F•‚“®‚¬‚”"_‚ð^µ‚¤‚±‚Æ‚ª‚Å‚«‚Ü‚·‚B‚u+‚v–‚”‚Í
        ‚u-‚v–‚”‚Í‚”Žš‚©‚çŽn‚Ü‚è‚A¬‚”"_‚Æ‚uE‚v‚ðŽg—p
        ‚·‚é‚±‚Æ‚ª‚Å‚«‚Ü‚·‚B
        —á‚D12.34   -.987   4.56E-3
    •¶Žš—ñ‚F‚u"‚v‚Å^Í‚Ü‚ê‚½‹L†‚^‚”Žš‚^ƒAƒ‹ƒtƒ@ƒxƒbƒg
        ‚Í‘S‚Ä•¶Žš—ñ‚É‚È‚è‚Ü‚·‚B
        —á‚D"abc" "12#$"

    ƒŠƒXƒg‚FƒAƒgƒ€‚ð‚u(‚v‚Æ‚u)‚v‚Å^Í‚ñ‚¾‚à‚Ì‚ðƒŠƒXƒg‚ÆŒ‚Ä‚Ñ‚Ü‚·‚B
        —á‚D(ABC 3.45 "xyz")   ((1E-3 "E#af") EFG)

        ‘‚^Ó‚D()‚ÍniI(ƒAƒgƒ€)‚É‚È‚è‚Ü‚·‚B

    "z—ñ‚FƒAƒgƒ€‚âƒŠƒXƒg‚ðŠi"[‚A‚«‚é1ŽŸŒ³‚Ì"z—ñ‚ðƒTƒ|‚[ƒg‚µ‚Ü‚·‚B
        ƒŠƒXƒg‚Æ—Ç‚Ž—‚Ä‚¢‚Ü‚·‚ª‚A‘’‚³‚ªŒÅ’è‚Å‚ ‚é‚±‚Æ‚Æ‚A
        "C^Ó‚Ì—v‘f‚É‚‘¬‚ÉƒAƒNƒZƒX‚Å‚«‚é“_‚ª^Ù‚È‚è‚Ü‚·‚B

‰ELISP‚ÌŠî–{•¶Œ^
    –¼‘O‚F–¼‘O‚ÉƒZƒbƒg‚³‚ê‚Ä‚¢‚é’l‚ðŽæ‚è‚o‚·‚B
    ‚”Žš‚F‚”ŽŽ©‘g‚ð•\‚·‚B
    •¶Žš—ñ‚F•¶Žš—ñŽ©‘g‚ð•\‚·‚B
    "z—ñ‚F‚PŽŸŒ³‚Ì"z—ñ‚ð•\‚·‚B
    (ŠÖ‚” [ˆø‚”] [ˆø‚” ...])‚FŠÖ‚”‚Éˆø‚”‚ð“n‚µ‚ÄŽÀ‚s‚·‚é‚B
    ((lambda([ˆø‚”–¼] [ˆø‚”–¼ ...]) ŽÀ‚s•‚“) [ˆø‚”] [ˆø‚” ...])
        ‚Fˆø‚”–¼‚Éˆø‚”‚ð‘Ý‘èŒã‚AŽÀ‚s•‚”‚ðŽÀ‚s‚·‚é‚B

‰ELISP‚ÌŠÖ‚”‚ÌŽí—Þ
    SUBRŒ^‚F‘g‚Ý‚ž‚ÝŠÖ‚”‚BŠeˆø‚”‚ð•]‰¿Œã‚AŠÖ‚”‚É“n‚·‚B
        —á‚Dcar cdr cons print
    FSUBRŒ^‚F‘g‚Ý‚ž‚ÝŠÖ‚”‚BŠeˆø‚”‚ð•]‰¿¹‚‚‚É‚A‘S‚Ä‚ˆø‚”‚ð
        ƒŠƒXƒg‚Ìó‘Ô‚ÅŠÖ‚”‚É“n‚·‚B‚æ‚Á‚Ä‚Aˆø‚”–¼‚Í‚P‚Â‚µ‚©©
        Ž‚Ä‚È‚¢‚B
        —á‚Dcond if switch prog
    EXPRŒ^‚Fƒ†[ƒU’è‹`ŠÖ‚”‚BŠeˆø‚”‚ð•]‰¿Œã‚AŠÖ‚”‚É“n‚·‚B

—á␣D(de '+- '(lambda(x y)(list (+ x y) (- x y))))

FEXPRŒ^␣Ff†␣[ƒU'è‹`ŠÖ␣"␣BŠeˆø␣",ð•]‰¿,¹,¸,É␣A'S,Ä,ÌˆØ␣"
,ðƒŠƒXƒg,Ì␣ó'Ô,ÅŠÖ␣",É"n,·␣B,æ,Á,Ä␣AˆØ␣"–¼,Í,P,Â,µ
,©Ž␣,Ä,È,¢␣B

—á␣D(df 'setq2 '(lambda(x)(set (car x) (eval(cadr x)))))

MACROŒ^␣Ff†␣[ƒU‹`ŠÖ␣"␣BŠeˆø␣",ð•]‰¿,¹,¸,É␣AŠÖ␣"‹y,Ñ'S
,Ä,ÌˆØ␣",ðƒŠƒXƒg,Ì␣ó'Ô,ÅŠÖ␣",É"n,µ␣AŽÀ␣sŒ‹‰Ê,ð␣Ä"x
•]‰¿,·,é␣BˆØ␣"–¼,Í,P,Â,µ,©Ž␣,Ä,È,¢␣B

—á␣D(dm 'allappend '(lambda(x)(expand (cdr x) 'append)))

ƒlƒuƒWƒFƒNƒgŽwŒü‚ÌŠî‘b’mŽ¯

EƒlƒuƒWƒFƒFƒNƒgŽwŒü(Object Oriented)‚Æ‚Í H
ƒlƒuƒWƒFƒFƒNƒgŽwŒü‚Æ‚¢‚¤‚Ì‚ÍAff ƒ[ƒ^‚âff ƒ[ƒ^‚ðŠi"[‚·‚é•Ï"
(ƒlƒuƒWƒFƒFƒNƒg)Ž©‘g‚ª A–½—ß(ƒ ƒbƒZ ƒW)‚É‘Î‚·‚é ^— "à—e‚ð
'm‚Á‚Ä‚¨‚è AƒlƒuƒWƒFƒFƒNƒg‚Éƒ ƒbƒZ ƒW‚ð‘—‚é‚±‚Æ‚Åvƒ ƒOf‰f€
‚ð ì‚é‚±‚Æ‚Æ‚ð‚¢‚¢‚Ü‚· B
ƒlƒuƒWƒFƒFƒNƒgŽwŒü‚Í AƒVƒ~ƒ… ƒŒ ƒVƒ‡f"‚âƒ}ƒ‹ƒ`ƒ^ƒXƒN Aƒ}ƒ‹ƒ`
ƒEƒCƒ "fh‚Ìƒvƒ ƒOf‰f€ŠJ"‚É–ð—§‚¿‚Ü‚· B‰ñ˜HƒVƒ~ƒ… ƒŒ ƒVƒ‡f"
‚Ì ê‡‚Å ‚ê‚ÎAftƒŠƒbƒvƒtƒ ƒbƒv‚âANDAOR"™‚ÌŠe‘fŽq‚ªƒlƒu
ƒWƒFƒFƒNƒg‚É‚È‚è A ‚éŽžŠÔ‚Ì'l‚ð'm‚è‚½‚¢‚Æƒ ƒbƒZ ƒW‚ð‘—‚ê‚Î
Še‘ü—Í'[Žq‚É‚Â‚È‚ª‚Á‚Ä‚¢‚éfŽq‚É X‚Éƒ ƒbƒZ ƒW‚ð‘—‚è A»‚Ì
"ü—Í'l‚Æ"à•" ó'Ô‚ðŒ³‚Éo—Í'l‚ð•Ô‚·‚æ‚¤‚É‚è‹‚µ‚Ä‚¨‚¾ ¯‚Å
fŽf~f…fŒ ƒfVƒ‡f"‚Å‚«‚Ü‚· Bƒ}ƒ‹ƒ`ƒ^ƒXƒN‚Å ‚ê‚Îƒefƒ ƒfh
‚ªƒTƒCƒY‚â•Ž¦^Ê'u‚ðŽ‚Á‚Ä‚¨‚è‚é A`‰æ–½—ß‚É‘Î‚·‚é“®‚ì"à—e‚ð
'è‹‚µ‚Ä‚¨‚¾ ¯‚Å‚ A‚¢‚Â Aã AƒfÍfŠ‚Ì ‚éˆÉA‚ÌfŒ ƒfh‚ð
•\Ž¦‚³‚¹ A»‚ê‚¼‚ê‚É•Ê‚X‚Ì‰æ‘æ‚ð•\Ž¦‚³‚é‚±‚Æ‚Æ‚ª‚Å‚«‚Ü‚· B

EƒlƒuƒWƒFƒFƒNƒgŽwŒü‚Ì—pŒê
ƒNƒ‰ƒX(class)
‹@"\‚ð‘è‹‚µ‚½‚à‚Ì‚Å A"¯‚¶‹@"\‚ð‰Ê‚½‚·‚à‚Ì‚Ì'Š ì‚é B
ƒ}ƒ‹ƒ`ƒfŒ ƒƒfh‚Å‚ÍAƒfŒ ƒfh‚ªƒNƒ‰ƒX‚Å‚»‚±‚É—Í X‚È
–½—ß‚É‘Î‚·‚éŽÀ Û‚ð^— •û–@‚©'è‹‚³‚ê‚Ä‚¢‚é B

ƒCƒ"ƒXƒ^ƒ"ƒX(instance)
ƒNƒ‰ƒX‚Å'è‹‚³‚ê‚½“à—e‚É‰ž‚¶‚ÄŽÀ Û‚É“®‚ì‚·‚é‚à‚Ì B
ƒ}ƒ‹ƒ`ƒfŒ ƒfh‚Å‚ÍAŽÀ Û‚É•\Ž¦‚³‚ê‚Ä‚¢‚é‚PˆÂ‚PˆÂ‚Ì
ƒfŒ ƒfh‚ªƒCƒ"ƒXƒ^ƒ"ƒX‚Å ‚é B

ƒNƒ‰ƒX•Ï"(class variable)
ƒNƒ‰ƒX‹y‚Ñ‚»‚ÌƒNƒ‰ƒX‚É‘®‚·‚éƒCƒ"ƒXƒ^ƒ"ƒX‘S‚É©‚ç
‹¤'Ê‚ÉŽQ Æ‚³‚ê‚é•Ï"Bƒ}ƒ‹ƒ`ƒfŒ ƒfh‚Å‚ÍŒ»Ý•\Ž¦
‚³‚ê‚Ä‚¢‚éƒfŒ ƒfh‚Ì""™‚ÌˆÂ•ñ‚ðŠi"[‚·‚é B

ƒCƒ"ƒXƒ^ƒ"ƒX•Ï"(instance variable)
ŒÂX‚ÌƒCƒ"ƒXƒ^ƒ"ƒXŒÅ—L‚Ì•Ï"Bƒ}ƒ‹ƒ`ƒfŒ ƒfh‚Å‚Í
ŠeƒfŒ ƒfh‚Ì•\Ž¦‚³‚ê‚Ä‚¢‚é^Ê'u‚âƒTƒCƒY"™‚Ì""™‚ð
Ši"[‚·‚é B

ƒXƒ pƒNƒ‰ƒX(super class)
•¡"‚ÌƒNƒ‰ƒX‚ª"¯‚¶‹@"\‚ðŽ‚Â‚±‚‡ A‹¤'Ê‹@"\‚Ì‚Ý‚ð
'è‹‚µ‚Ä V‚µ‚ÈƒNƒ‰ƒX‚ð ì‚é‚±‚Æ‚ª‚Å‚«‚é B‚±‚ÌƒNƒ‰ƒX
‚ðƒXƒ pƒNƒ‰ƒX‚ÆŒÄ‚Ô B»‚Ì ê‡ AŒ³‚ÌƒNƒ‰ƒX‚Ì'è‹
‚Ì†AƒXƒ pƒNƒ‰ƒX‚à'è‹‚µ‚Ä‚¨•K—v‚ª ‚é B

Œp³(inheritance)

, ,éƒNƒ‰ƒX‚ªƒX[ƒp[ƒNƒ‰ƒX‚Ì'è‹`‚àŽQÆ‚Å‚«‚é‚±‚Æ‚ð
Œp³‚ÆŒÄ‚Ñ‚Ü‚·BŽÀÛ‚Éƒvƒ[ƒOƒ‰ƒ€‚ðŽÀ‚s‚·‚é‚ê‡‚Í A
‚Ü‚ƒNƒ‰ƒX‚Ì'è‹`‚©‚çŽÀ‚s"à—e‚ð'T‚µ A‚È¯‚ê‚ÎƒX[ƒp[
ƒNƒ‰ƒX‚©‚çŽÀ‚s"à—e‚ð'T‚µ A‚È¯‚ê‚Î‚X‚É‚»‚ÌƒX[ƒp[ƒN
ƒ‰ƒX‚©‚ç'T‚µ‚Ü‚·B

ƒƒbƒZ[ƒW(message)
ƒIƒuƒWƒFƒNƒg(ƒNƒ‰ƒX‚ÆƒCƒ"ƒXƒ^ƒ"ƒX)‚É'Î‚·‚é–½—ß B
ƒIƒuƒWƒFƒNƒgŽwŒü‚Å‚Í AƒIƒuƒWƒFƒNƒg‚ÉƒƒbƒZ[ƒW‚ð
'—‚é‚±‚Æ‚Åƒvƒ[ƒOƒ‰ƒ€‚ðŽÀ‚s‚µ‚Ü‚·B

ƒƒ\ƒbƒh(method)
ƒƒbƒZ[ƒW‚É'Î‚·‚éŽÀÛ‚Ì‚ˆ—‚"à—e‚Ì‚±‚Æ‚Æ B

Šî–{'€ì

E‰æ–Ê\¬\¬
Text Window
‹N"®Žž,É•\Ž¦,³,ê,é'å,«,ÈƒEƒCƒ"ƒh,Å AŽÀ sŒ‹‰Ê"™,ð•\Ž¦,µ,Ü,· B,S,O,O s•ª,Ìƒoƒbƒtƒ@,ðŽ ,Á,Ä,¨,è AƒXƒNƒ [ƒ‹ƒo [,ð'€ ì,·,é,±,Æ,ÅƒXƒNƒ [ƒ‹ o—ˆ,Ü,· B

Input Window
Text Window,Ì‰º,É•\Ž¦,³,ê,é,P s•ª,ÌƒEƒCƒ"ƒh,Å,· B ƒRƒ}ƒ"ƒh,ð"ü—Í,µ,½,è AƒvƒƒOƒ‰ƒ€'†,ÅƒL ["ü—Í,ð—v ‹ ,³,ê,½ ê ‡ A,±,ÌƒEƒCƒ"ƒh,É"ü—Í,µ,ÄƒŠƒ^ [ƒ"ƒL [,ð‰Ÿ,µ,Ä,,¾,³,¢ B

Graphic Window
gr_open–½—ß,É,æ,è•\Ž¦,Å,«,éƒEƒCƒ"ƒh,Å,· B•W €,Å ƒXƒNƒ [ƒ‹ƒo [,y,ÑƒXƒNƒ [ƒ‹ ‹<@" Aƒ}ƒEƒX §Œä‹@" \ ,ð"à' ,µ,Ä,¢,é,½,ß A—eˆÕ,É,f,t,hƒvƒƒOƒ‰ƒ€,ª ì¬ ,Å,«,Ü,· B

Eƒvƒ‹ƒ_ƒEƒ"ƒ ƒjƒ…[(Text Window,Ìƒ ƒjƒ…[)
File - Open File
'I'ð,µ,½ƒtƒ@ƒCƒ‹,ª"Ç,Ý ž,Ü,êŽÀ s,³,ê,Ü,· B•Ê,Ìƒ B ƒŒƒNƒgƒŠ,âƒ BƒXƒN,Ìƒtƒ@ƒCƒ‹,ð'I'ð,µ,½,¢ ê ‡,Íˆê—— •\,ðƒ}ƒEƒX,Åƒ_ƒuƒ‹ƒNƒŠƒbƒN,µ,Ä,,¾,³,¢ B

File - Exit
YOOL for Windows,ð I—¹,µ,Ü,· B

Help - Help
Žg,¢•û,Ì à–¾,ª•\Ž¦,³,ê,Ü,· B

Help - About
YOOL for Windows,Ìƒo [ƒWƒ‡ƒ",ª•\Ž¦,³,ê,Ü,· B

CE£Å©‰,©,ç'è‹`,³,ê,Ä,¢,éƒAƒgƒ€

<u>nil</u>
<u>f</u>
<u>t</u>
<u>oblist</u>
<u>self</u>
<u>super</u>

EŠÖ"'è‹`—pŠÖ"

- **de**
- **df**
- **dm**
- **lambda**

␦E•]‰¿ŠÖ␦”

- **eval**
- **evlis**
- **apply**
- **prog**
- **loop**
- **return**
- **go**
- **mapc**
- **mapcar**
- **mapcan**

E•Ï"'ã"üŠÖ"

- **set**
- **setq**
- **setf**

􀀀E‘®􀀀«􀀀§ŒäŠÖ􀀀"

putprop
get
getex
getfex
getm

Eð Œ ŠÖ "
- **cond**
- **if**
- **switch**
- **atom**
- **symbolp**
- **numberp**
- **stringp**
- **listp**
- **objectp**
- **null**
- **eq**
- **equal**
- **member**
- **greaterp,>**
- **lessp,<**
- **not**
- **and**
- **or**

EfŠfXfg〔ˆ—〕ŠÖ〕"

- **cons**
- **rplaca**
- **rplacd**
- **car,first**
- **cdr**
- **c??r**
- **c???r**
- **c????r**
- **second**
- **third**
- **fourth**
- **fifth**
- **sixth**
- **seventh**
- **eighth**
- **ninth**
- **tenth**
- **nth**
- **nthcdr**
- **list**
- **assoc**
- **pair**
- **append**
- **nconc**
- **copy**
- **reverse**
- **last**
- **delete**
- **subst**

E"ü□o—ÍŠÖ□"

read
sread
print
princ
openr
openw
close
fread
freads
freadc
fprint
fwrites
fwritec
load

Eftƒ@ƒCƒ‹§ŒäŠÖ”

cd

dir

EŽZp‰‰ŽZŠÖ"

- **plus,+**
- **difference,-**
- **times,***
- **quotient,/**
- **divide**
- **remainder,%**
- **abs**
- **random**
- **sin**
- **cos**
- **tan**
- **asin**
- **acos**
- **atan**
- **expt**
- **exp**
- **sqrt**
- **log**
- **truncate**
- **float**

E"z—ñ§ŒäŠÖ"

make-array

vector

aref

E•¶Žš—ñ§ŒäŠÖ"

- **ascii**
- **char**
- **concat**
- **glc**
- **gnc**
- **s2l**
- **strlng**
- **substr**

ꀀEƒIƒuƒWƒFƒNƒgŽwŒüšŠÖŒW,ÌŠÖꀀ"

class
instance
add_cmethod
add_imethod

グラフィック関数

gr_open
gr_close
gr_xy
gr_size
gr_vsize
gr_line
gr_box
gr_boxf
gr_circle
gr_pset
gr_symbol
rgb

Ef}ƒEƒX§ŒäŠÖ"
ms_btn
ms_left
ms_right

E,»,Ì'¼,ÌŠÖ"

date
time
ontime
gc
gcmsg
promp

nil

ƒ^ƒCƒv FƒAƒgƒ€

‹@"\ F u–³,µ v,â u‹U v,ÌˆÓ–¡,ðŽ ,¿ AƒŠƒXƒg,Ì ÅŒã,â ðŒ
•s ¬—§,ð•\,·B

'l Fnil

f

ƒ^ƒCƒv␣FƒAƒgƒ€

‹@”\␣F␣u–³,µ␣v,â␣u‹U␣v,Ì^Ó–¡,ðŽ␣,¿␣AƒŠƒXƒg,Ì␣ÅŒã,â␣ðŒ␣

　　•s␣¬—§,ð•\,·␣B　**nil**　,ðŽ¦,·␣B

'l␣Fnil

t

ƒ^ƒCƒv FƒAƒgƒ€

‹@"\ F ðŒ ,ª ¬—§,µ,½,±,Æ,ð•\,· B

'l Ft

oblist

ƒ^ƒCƒv FfAfgf€
‹@"\ F'è‹`,³,ê,Ä,¢,é'S,Ä,ÌƒAƒgƒ€,ðƒŠƒXƒg,É,µ,½,à,Ì B
'l F'S,Ä,ÌƒAƒgƒ€,ðƒŠƒXƒg,É,µ,½,à,Ì

self

ƒ^ƒCƒv›FƒNƒ‰ƒX–",ÍƒCƒ"ƒXƒ^ƒ"ƒX

‹@"\›FƒNƒ‰ƒX–",ÍƒCƒ"ƒXƒ^ƒ"ƒX,Ìƒ›ƒ\ƒbƒh,ð‹L›q,·,é›ê›‡›A
Ž©•ªŽ©›g,ðŽw,·,½,ß,ÉŽg—p,·,é›B

'l›FƒNƒ‰ƒX–",ÍƒCƒ"ƒXƒ^ƒ"ƒXŽ©›g

super

ƒ^ƒCƒv FƒNƒ‰ƒX

‹@”\ FƒNƒ‰ƒX–”,ÍƒCƒ"ƒXƒ^ƒ"ƒX,Ìƒ ƒ\ƒbƒh,ð‹L q,·,é ê ‡ A
Ž© •ª,ÌƒX [ƒp [ƒNƒ‰ƒX,ðŽw,·,½,ß,ÉŽg—p,·,é B
'l FŽ© •ª,ÌƒX [ƒp [ƒNƒ‰ƒX

de

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(de arg1 arg2)   arg1:atom   arg2:all

‹@”\ FEXPRƒ^ƒCƒv,ÌŠÖ ”,ð’è‹`,·,é Barg1,ªŠÖ ”–¼ Aarg2,ªŠÖ ”,Ì’è‹` B

   ,È,¨ AŠÖ ”arg1,Ì’è‹`,ð’m,è,½,¢ ê ‡,Í A(**getex** arg1),Æ,µ,Ä

‰º³,¢ B

—á,P F(de 'first 'car) => first

   (first '(a b)) => a

—á,Q F(de 'add2 '(lambda(x y)(+ x y))) => add2

   (add2 123 456) => 579

Œ‹‰Ê Farg1

df

ƒ^ƒCƒv FSUBRŠÖ ”

’Ž® F(df arg1 arg2)　　arg1:atom　arg2:all

‹@”\ FFEXPRƒ^ƒCƒv,ÌŠÖ ”,ð'è‹`,·,é Barg1,ªŠÖ ”–¼ Aarg2,ªŠÖ ”,Ì’è‹` B

,È,¨ AŠÖ ”arg1,Ì'è‹`,ð'm,è,½,¢ ê ‡,Í A(**getfex** arg1),Æ,µ,Ä‰º,³,¢ B

—á F(df '= '(lambda(x)(set (car x) (eval (cadr x)))))) => =
(= aaa (+ 1 2)) => aaa
aaa => 3

Œ‹‰Ê Farg1

dm

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(dm arg1 arg2) arg1:atom arg2:all

‹@”\ FMACROƒ^ƒCƒv,ÌŠÖ ”,ð’è‹`,·,é Barg1,ªŠÖ ”–¼ Aarg2,ªŠÖ ”,Ì’è‹` B

 ,È,¨ AŠÖ ”arg1,Ì’è‹`,ð’m,è,½,¢ ê ‡,Í A(**getm** arg1),Æ,µ,Ä‰º³,¢ B

—á F(dm 'alladd '(lambda(x)(cons '+ (cdr x)))) => alladd

(alladd 1 2 3 4 5) => 15

Œ‹‰Ê Farg1

lambda

ƒ^ƒCƒv FƒAƒgƒ€

 ’Ž® F((lambda arg1 arg2) arg3) arg1:list   arg2:all   arg3:list

‹@”\ Farg1,Íˆø ”,ÌƒŠƒXƒfg Aarg2,ÍŽÀ sfvƒ ƒOƒ‰ƒ€ Aarg3,Íˆø ”,Ì’l B

arg3,ð‰‰ŽZ,µ,½Œ‹‰Ê,ðarg1,Íˆø ”,É Ý’è,µ Aarg2,É]

,Á,Äƒvƒ ƒO

ƒ‰ƒ€,ðŽÀ s,·,é B

—á F((lambda(x y)(+ x y)) 12 67)

Œ‹‰Ê Farg2,ÌŽÀ sŒ‹‰Ê

eval

ƒ^ƒCƒv⬚FSUBRŠÖ⬚”

⬚'Ž®⬚F(eval arg1)   arg1:all

‹@”\⬚Farg1,ð•]‰¿(ŽÀ⬚s),·,é⬚B

—á⬚F(eval (list '+ 12 34)) => 46

Œ‹‰Ê⬚Farg1,Ì•]‰¿(ŽÀ⬚s)Œ‹‰Ê

evlis

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(evlis arg1)　　　　　arg1:list

‹@”\ Farg1,ðcar•”,©,ç ‡”Ô,É•]‰¿,µ AfŠƒXƒg,É,·,é B

—á F(evlis (list '(+ 1 2) '(* 3 4))) => (3 12)

Œ‹‰Ê Farg1,Ì'S,Ä,Ì—v‘f,ð•]‰¿,µ,½Œ‹‰Ê,ðƒŠƒXƒg,É,µ,½,à,Ì

apply

ƒˆƒCƒv□FSUBRŠÖ□”

□'Ž®□F(apply arg1 arg2)　　arg1:ŠÖ□”–”‚Í(lambdaŽ®　arg2:list

‹@”\□Farg1‚Éˆø□”‚Æ‚µ‚Äarg2‚ð“n‚µ□A•]‰¿‚·‚é□B

—á□F(apply '(lambda(x y)(+ x y)) '(1 2)) => 3

Œ‹‰Ê□Farg1‚Éˆø□”arg2‚ð“n‚µ‚Ä•]‰¿‚µ‚½Œ‹‰Ê

prog

ƒ^ƒCƒv FFSUBRŠÖ ”

 ‘Ž® F(prog ver arg1 arg2 …)　　ver:ƒ [ƒ]ƒ‹•Ï ”ƒŠƒXƒg　arg:list,atom

‹@”\ F,Ü, ¸ Aver,É ‘,©,ê,Ä,¢,é•Ï ”,ÌŒ³,Ì'I,ð‘Ò”ð,µ Anil,ð Ý'è,µ,Ü,· B

　　　,»,ÌŒã Aarg1,©,çﾉ‡,É•]‰¿,·,é B I—

¹,·,é,Æ•Ï ”,Ì'I,Í•œŒ³³,ê,Ü,· B

　　　,È,¨ Aarg,ªƒAƒgƒ€,Ì ê ‡,Í　**go**　,Ìƒ‰ƒxƒ‹,Æ,µ,Äˆµ,í,ê A•]‰

¿,³,ê,Ü,¹,ñ B

　　　go　–½—ß,Å•ªŠò,µ,½,è A　**return**　,ÅŽÀ s,ð I—¹,³,¹,é,±

,Æ,à,Å,«,Ü,· B

—á F(prog(x)(setq x 123)(prog(x)(print x))(print x)) => nil 123 123

　　(prog(x y)(setq x 111)(setq y 222)(+ x y)) => 333

Œ‹‰Ê F ÅŒã,ÉŽÀ s,µ,½–½—ß,ÌŒ‹‰Ê B

loop

ƒ^ƒCƒv⬚FFSUBRŠÖ⬚"

⬚'Ž®⬚F(loop ver arg1 arg2 ...)　　ver:ƒ⬚⬚[ƒJƒ‹•Ï⬚"ƒŠƒXƒg　arg:list,atom

‹@"\⬚F,Ü,¸⬚Aver,É⬚',©,ê,Ä,¢,é•Ï⬚",ÌŒ³,Ì'l,ð'Ò"ð,µ⬚Anil,ð⬚Ý'è,µ,Ü,·⬚B

　,»,ÌŒã⬚Aarg1,©,ç⬚‡,É•]‰

¿,·,é⬚BƒŠƒXƒg,Ì⬚ÅŒã,É'B,·,é,Æ⬚Ä"xarg1,©,ç

　•]‰¿,ðŠJŽn,µ,Ü,·⬚B,»,Ì,½,ß⬚A•K,¸　__return__　,ÅŽÀ⬚s,ð⬚l—¹,³,¹,é•K

—v,ª,

　,è,Ü,·⬚B⬚l—¹,·,é,Æ•Ï⬚",Ì'l,Í•œŒ³,³,ê,Ü,·⬚B

　,È,¨⬚Aarg,ªƒAƒgƒ€,Ì⬚ê⬚‡,Í　__go__　,Ìf‰ƒxƒ‹,Æ,µ,Äˆµ,í,ê⬚A•]‰

¿,³,ê,Ü,¹,ñ⬚B

　　__go__　–½—ß,Å•ªŠò,³,¹,é,±,Æ,à,Å,«,Ü,·⬚B

—á⬚F(prog(x sum)

　　(setq sum 0)

　　(setq x 10)

　　(loop()

　　　(setq sum (+ sum x))

　　　(if (zerop x)(return sum))

　　　(setq x (sub1 x))

　))

　　=> 55

Œ‹‰Ê⬚Freturn–½—ß,ÌŒ‹‰Ê

go

ƒ^ƒCƒv□FFSUBRŠÖ□"

□'Ž®□F(go label)　　label:atom

‹@"\□F **prog** ,â **loop** ,Ì'†,Å□Alabel,É'Š"–,·,éƒAƒgƒf€,ª‹L□q,³,ê,Ä,¢,é
　　•"•ª,É•ªŠò,·,é□B

—á□F(prog(x sum)
　　　(setq sum 0)
　　　(setq x 10)
　　　LOOP1
　　　(setq sum (+ sum x))
　　　(setq x (sub1 x))
　　　(if (> x 0)(go LOOP1))
　　　(return sum)
　　)
　　　=> 55

Œ‹‰Ê□F–³,µ

return

ƒ^ƒCƒv￮FFSUBRŠÖ￮"

￮'Ž®￮F(return arg1)   arg1:all

‹@"\￮F **prog** ,â **loop** ,Ì'†,Å￮A•]‰¿,ð￮I—¹,µ￮AŒ‹‰Ê,Æ,µ,Äarg1,ð
•]‰¿,µ,½Œ‹‰Ê,ð•Ô,·￮B

—á￮F(prog(x sum)
      (setq sum 0)
      (setq x 10)
      LOOP1
      (setq sum (+ sum x))
      (setq x (sub1 x))
      (if (zerop x)(return sum))
      (go LOOP1)
)
      => 55

Œ‹‰Ê￮Farg1,ð•]‰¿,µ,½Œ‹‰Ê

mapc

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(mapc arg1 arg2)   arg1:ŠÖ ”–”,ÍlambdaŽ®   arg2:list

‹@”\ Farg2,Ìcar•”,©,ç ‡”Ô,Éarg1,Ì ø ”,Æ,µ,Ä"n,µ A•]‰¿,·,é B

     ,È,¨ Aarg1,Í,PˆøŠ ”ŠÖ ”,Å, ,é•K—v,ª, ,è,Ü,· B

—á F(mapc 'print '(a (b c) d))

Œ‹‰Ê Ft

mapcar

ƒ^ƒCƒv FSUBRŠÖ ”

‘Ž® F(mapcar arg1 arg2)　　arg1:ŠÖ ”–”,ÍlambdaŽ®　arg2:list

‹@”\ Farg2,Ìcar•”,©,ç ‡”Ô,Éarg1,ÌˆØ ”,Æ,µ,Ä“n,µ A•]‰¿Œ‹‰Ê,ð
　　ƒŠƒXƒg,É·,é B,È,¨ Aarg1,Í,Pˆø ”ŠÖ ”,Å, ,é•K—v,ª, ,è,Ü
　　,· B

—á F(mapcar '(lambda(x)(* x x)) '(1 2 3)) => (1 4 9)

Œ‹‰Ê Farg2,Ì‘S,Ä,Ì—v‘f,ðarg1,Å•]‰¿,µ,½Œ‹‰Ê,ðƒŠƒXƒg,É,µ,½, à,Ì

mapcan

ƒ^ƒCƒv￿FSUBRŠÖ￿"

￿'Ž®￿F(mapcan arg1 arg2)　　arg1:ŠÖ￿"–",ÍlambdaŽ®　arg2:list
‹@"\￿Farg2,Ìcar•",©,ç￿‡"Ô,Éarg1,Ìˆø￿",Æ,µ,Ä"n,µ￿A•]‰¿Œ‹‰Ê,ð

　　　append　,·,é￿B,È,¨￿Aarg1,Í,Pˆø￿"ŠÖ￿",Å,　,é•K—v,ª,　,è,Ü
　　　,·￿B,Ü,½￿AŠe•]‰¿Œ‹‰Ê,ÍfŠƒXfg,Å,　,é•K—v,ª,　,è,Ü,·￿B

—á￿F(mapcan '(lambda(x)(list x "#")) '(1 2 3)) => (1 # 2 # 3 #)
Œ‹‰Ê￿Farg2,Ì'S,Ä,Ì—v'f,ðarg1,Å•]‰¿,µ,½Œ‹‰Ê,ð,Â,È,¢,¾,à,Ì

set

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(set arg1 arg2)　　arg1:•]‰¿Œ‹‰Ê,ª–¼‘O　arg2:all

‹@”\ Farg1,Ì•]‰¿Œ‹‰Ê,Ì–¼‘O,É Aarg2,Ì•]‰¿Œ‹‰Ê,ð‘ã“ü,·,é B

　　arg1,ð•]‰¿,µ,È,¢　**setq**　,Æ‹æ•Ê,·,é,±,Æ B

—á F(set (car '(abc def)) 123) => abc

　　abc => 123

Œ‹‰Ê F‘ã“ü,µ,½–¼‘O

setq

ƒ^ƒCƒv FFSUBRŠÖ ”

 ‘Ž® F(setq arg1 arg2)   arg1:–¼‘O   arg2:all

‹@”\ F–¼‘Oarg1,É Aarg2,Ì•]‰¿Œ‹‰Ê,ð‘ã“ü,·,é Barg1,ð•]‰¿,µ,Ä

 ,©,ç‘ã“ü,·,é **set** ,Æ‹æ•Ê,·,é,±,Æ B

—á F(setq abc 123) => abc

    abc => 123

Œ‹‰Ê F‘ã“ü,µ,½–¼‘O

setf

ƒ^ƒCƒv FFSUBRŠÖ ”

 ʼŽ® F(setf arg1 arg2)　　arg1:all　arg2:all

‹@”\ Farg1,ªŽ¦,·ƒ|ƒCƒ"ƒ^,ð Aarg2,Ì•]‰¿Œ‹‰Ê,É'u,«Š·,¦,é B

　　　　rplaca　,â　**rplacd**　,Æ"¯—I,É—á,Ì,æ,¤,È•›ì—
p,ª, ,è,Ü,·,Ì,Å' ˆˆÓ‰º,³,¢ B

　—á F(setf abc '(1 2)) => (1 2)　　(setq abc 123),Æ"¯,¶
　　abc => (1 2)
　　(setf (car abc) 3) => (3 2)　 (rplaca abc 3),Æ"¯,¶
　　abc => (3 2)
　　(setf (cdr abc) 4) => (3 . 4) (rplacd abc 4),Æ"¯,¶
　　(setq vec (vector 1 2 3)) => vec
　　(setf (aref vec 1) '(4 5)) => #(1 (4 5) 3)
Œ‹‰Ê F'ã"ü,µ,½'l(arg2,Ì•]‰¿Œ‹‰Ê)

putprop

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(putprop arg1 arg2 arg3)

              arg1:–¼‘O   arg2:all   arg3:–¼‘O

‹@”\ F–¼‘Oarg1,É A‘® «arg3,Æ,µ,Äarg2,ð Ý’è,·,é B’larg2,Í
      (**get** arg1 arg3),ÅŽæ,è o,·,±,Æ,ª,Å,«,é B

—á F(putprop 'car " Å ‰,Ì’l,ðŽæ,è o,·" 'help) => car
    (get 'car 'help) => Å ‰,Ì’l,ðŽæ,è o,·

Œ‹‰Ê F–¼‘Oarg1

get

ƒ^ƒCƒv FSUBRŠÖ”

Ž®F(get arg1 arg2)　　arg1:–¼‘O　arg2:–¼‘O

‹@”\F–¼‘Oarg1,Ì‘® «arg2,Ì’l,ðŽæ,è o,· B

—á F(putprop 'car " Å ‰,Ì’l,ðŽæ,è o,·" 'help) => car

　　(get 'car 'help) => Å ‰,Ì’l,ðŽæ,è o,·

Œ‹‰Ê F® «,Ì’l

getex

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(getex arg1)　　arg1:EXPRŠÖ ”

‹@”\ FEXPRƒ^ƒCƒv,ÌŠÖ ”,Ì’è‹`,ðŽæ,è o,· B

Œ‹‰Ê FEXPRŠÖ ”arg1,Ì’è‹`

getfex

ƒ^ƒCƒv FSUBRŠÖ”

’Ž® F(getfex arg1)　　arg1:FEXPRŠÖ”

‹@”\ FFEXPRƒ^ƒCƒv,ÌŠÖ”,Ì’è‹`,ðŽæ,è o,· B

Œ‹‰Ê FFEXPRŠÖ”arg1,Ì’è‹`

getm

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(getm arg1)   arg1:MACROŠÖ ”

‹@” \ FMACROƒ^ƒCƒv,ÌŠÖ ”,Ì'è‹`,ðŽæ,è o,· B

Œ‹‰Ê FMACROŠÖ ”arg1,Ì'è‹`

cond

ƒ^ƒСƒv FFSUBRŠÖ ”

 ’Ž® F(cond ((argc1 arge1) (argc2 arge2) (...))

    argc: ðŒ   arge:ŽÀ s•”

‹@” \ Fargc,ð'O,©,ç ‡"Ô,É•]‰¿,µ Anilˆ ÈŠO,Ì'I,Å, ,Á,½ ê ‡ A

    arge,ª•]‰¿,³,ê,é B

—á F(de 'wa '(lambda(x)(cond ((zerop x) 0)(t (+ x (wa (-- x)))))))

    (wa 100) => 5050

Œ‹‰Ê F ðŒ ,ð–ž,½,·,à,Ì,ª, ,ê,Î AŽÀ s•”arge,ð•]‰¿,µ,½Œ‹‰Ê

    –³,¢ ê ‡,Í Anil

if

ƒ^ƒCƒv␣FFSUBRŠÖ␣"

␣'Ž®␣F(if arg1 arg2 [arg3])　arg1:␣ðŒ␣　arg2,arg3:ŽÀ␣s•"

‹@"\␣Farg1,ð•]‰¿,µnilˆÈŠO,Ì'I,Å, ,Á,½␣ê␣‡arg2,ªŽÀ␣s,³,ê␣Anil,Ì
　　␣ê␣‡,Íarg3,ª•]‰¿,³,ê,é␣B,È,¨␣Aarg3,Í␣È—ª‰Â"\␣B

—á␣F(de 'wa '(lambda(x)(if (zerop x) 0 (+ x (wa (-- x))))))
　　(wa 100) => 5050

Œ‹‰Ê␣Farg1,Ì•]‰¿Œ‹‰Ê,ªnilˆÈŠO,È,çarg2,ð•]‰¿,µ,½Œ‹‰Ê
　　nil,Åarg3,ª‹L␣q,³,ê,Ä,¢,é␣ê␣‡arg3,ð•]‰¿,µ,½Œ‹‰Ê
　　nil,Åarg3,ª␣È—ª,³,ê,Ä,¢,é␣ê␣‡nil

switch

ƒ^ƒCƒv⬚FFSUBRŠÖ⬚"

⬚'Ž®⬚F(switch val (case1 arg1) (case2 arg2) (…))

　　　val:"»'è,µ,½,¢'l　case:⬚ðŒ⬚　arg:ŽÀ⬚s•"

‹@"\⬚Fval,ð•]‰¿,µ⬚A,»,ÌŒ‹‰Ê,ð'O,©,ç⬚‡"Ô,Écase,Æ"äŠr,µ⬚Aˆê'v

　　,·,é,à,Ì,ª,　,ê,Îarg,ª•]‰¿,³,ê,é⬚B'A,µ⬚Acase,ªt,Ì⬚ê⬚‡,Í

　　•K,¸,»,Ìarg,ªŽÀ⬚s,³,ê,é⬚B

—á⬚F(de 'wa '(lambda(x)(switch x (0 0)(t (+ x (wa (-- x)))))))

　　(wa 100) => 5050

Œ‹‰Ê⬚Fval,Ì•]‰¿Œ‹‰Ê,Æˆê'v,·,é⬚A–",Ícase,ªt,È,çarg,Ì•]‰¿Œ‹‰Ê

　　ˆê'v,·,é,à,Ì,ª–³,¢⬚ê⬚‡,Í⬚Anil

atom

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(atom arg1)   arg1:all

‹@”\ Farg1,ªƒAƒgƒ€,È,çt AƒAƒgƒ€ˆÈŠO,È,çnil,ð•Ô,· B

Œ‹‰Ê Ft–”,Ínil

symbolp

ƒ^ƒCƒv FSUBRŠÖ ”
 ’Ž® F(symbolp arg1)   arg1:all
‹@” \ Farg1,ª–¼'O,È,çt A–¼'OˆÈŠO,È,çnil,ð•Ô,· B
Œ‹‰Ê Ft–",Ínil

numberp

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(numberp arg1)　　　arg1:all

‹@”\ Farg1,ª ”Žš,È,çt A ”Žšˆ ÈŠO,È,çnil,ð•Ô,· B

Œ‹‰Ê Ft–",Ínil

stringp

ƒ^ƒCƒv FSUBRŠÖ ”

’Ž® F(stringp arg1)　　　arg1:all

‹@”\ Farg1,ª•¶Žš—ñ,È,çt A•¶Žš—ñˆÈŠO,È,çnil,ð•Ô,·B

Œ‹‰Ê Ft–”,Ínil

listp

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(listp arg1)   arg1:all

‹@”\ Farg1,ªƒŠƒXƒg,È,çt AƒŠƒXƒgˆÈŠO,È,çnil,ð•Ô,· B

Œ‹‰Ê Ft–”,Ínil

objectp

ƒ^ƒCƒv⬚FSUBRŠÖ⬚”

⬚'Ž®⬚F(objectp arg1)   arg1:all

‹@”\⬚Farg1,ªƒIƒuƒWƒFƒNƒg(ƒNƒ‰ƒX–",ÍƒCƒ"ƒXƒ^ƒ"ƒX),È,çt⬚AƒIƒu
ƒWƒFƒNƒgˆÈŠO,È,çnil,ð•Ô,·⬚B

Œ‹‰Ê⬚Ft–",Ínil

null

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(null arg1)　　　arg1:all

‹@”\ Farg1,ªnil,È,çt Anilˆ ÈŠO,È,çnil,ð•Ô,· B

Œ‹‰Ê Ft–",Ínil

eq

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(eq arg1 arg2)　arg1,arg2:all

‹@”\ Farg1,Æarg2,ìƒ|ƒCƒ“ƒ^,ª^ê’v A–”,Í‹¤,É ”Žš,Å’I,ª“™,µ,¢ A
　　–”,Í‹¤,É•¶Žš—ñ,Å’I,ª“™,µ,¢,È,çt A,»,êˆÈŠO,È,çnil,ð•Ô,· B

　　　equal　,Æ,Ìˆá,¢,É’ ˆÓ,·,é,±,Æ B

Œ‹‰Ê Ft–”,Ínil

equal

ƒ^ƒCƒv FSUBRŠÖ ”

’Ž® F(equal arg1 arg2)   arg1,arg2:all

‹@”\ Farg1,Æarg2,Ì“à—e,ª^ê’v,·,é,È,çt A•sˆê’v,È,çnil,ð•Ô,· B

   eq   ,Æ,Ì^á,¢,É’ ˆÓ,·,é,±,Æ B

Œ‹‰Ê Ft–”,Ínil

member

 ƒ^ƒCƒv⯞FSUBRŠÖ⯞”

 ⯞'Ž®⯞F(member arg1 arg2)   arg1:atom arg2:list

 ‹@”\⯞FƒŠƒXƒgarg2,ÌŒÂ⯞X,Ì—v'f,ðarg1,Æ"äŠr,µ⯞Aˆê'v(__eq__),·,ê,Î

     arg1ˆÈ⯞~,ÌƒŠƒXƒg,ð•Ô,·⯞BŠÜ,Ü,ê,Ä,¢,È,¯,ê,Înil,ð•Ô,·⯞B

 —á⯞D(member 'd '(a b c d e)) => (d e)

     (member 'a '((a b) c d e)) => nil

 Œ‹‰Ê⯞Farg1ˆÈ⯞~,ÌƒŠƒXƒg–",Ínil

greaterp,>

ƒ^ƒCƒv FSUBRŠÖ"

’Ž® F(greaterp arg1 arg2)　arg1,arg2:number

‹@"\ F'l,ªarg2,æ,è,àarg1,ª'å,«,¢ ê ‡,Ít A"™,µ,¢,©
　　arg2,Ì•û,ª'å,«,¢ ê ‡,Ínil,ð•Ô,· B

—á D(greaterp 2 3) => nil
　　(> 3 2) => t

Œ‹‰Ê Ft–",Ínil

lessp,<

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(lessp arg1 arg2)　　　arg1,arg2:number

‹@"\□F'l,ªarg2,æ,è,àarg1,ª□¬,³,¢□ê□‡,Ít□A"™,µ,¢,©
　　　arg2,Ì•û,ª□¬,³,¢□ê□‡,Ínil,ð•Ô,·□B

—á□D(lessp 2 3) => t
　　(< 3 2) => nil

Œ‹‰Ê□Ft–",Ínil

not

ƒ^ƒCƒv　FSUBRŠÖ　”

　'Ž®　F(not arg1)　　　arg1:all

‹@”\　Farg1,ªnil,È,çt　AniLˆÈŠO,È,çnil,ð•Ô,·　B

　　　null　,Æ"™,µ,¢　B

Œ‹‰Ê　Ft–",Ínil

and

ƒ^ƒCƒv FFSUBRŠÖ ”

 ’Ž® F(and arg1 arg2 ...)   arg:all

‹@”\ Farg1,©,ç ‡,ÉŽÀ s,µ A'l,ªnil,É,È,Á,½Žž"_,ÅŽÀ s,ð'âŽ~,µ
     nil,ð•Ô,· B'S,Änilˆ ÈŠO,Ì'l,¾,Á,½ ê ‡,Ít,ð•Ô,· B

—á D(and (print 1) (print 2) (print nil) (print 3)) => 1 2 nil nil
     (and (print 1) (print 2) (print 3)) => 1 2 3 t

Œ‹‹‰Ê Ft–",Ínil

or

ƒ^ƒCƒv FFSUBRŠÖ ”
’Ž® F(or arg1 arg2 ...)   arg:all
‹@”\ Farg1,©,ç ‡,ÉŽÀ s,µ A'l,ªnilˆÈŠO,É,È,Á,½Žž“_,ÅŽÀ s,ð'âŽ~,µ
    t,ð•Ô,· B'S,Änil,¾,Á,½ ê ‡,Ínil,ð•Ô,· B
—á D(or (print nil) (print 1) (print 2) (print 3)) => nil 1 t
    (or (print nil) (print nil) (print nil)) => nil nil nil nil
Œ‹‰Ê Ft–",Ínil

cons

ƒ^ƒCƒv FSUBRŠÖ "

 'Ž® F(cons arg1 arg2)   arg1:all   arg2:all

‹@" \ FCAR• ",ªarg1 ACDR• ",ªarg2,Æ,È,é,æ,¤,ÈƒŠƒXƒg,ð ì,é B
    arg2,ªƒŠƒXƒg,Ì ê ‡,Í Aarg2,Ì'O,Éarg1,ð'Ç‰Á,µ,½ƒŠƒX
    ƒg,É,È,è,Ü,· B

—á F(cons 'a 'b)   => (a . b)
    (cons 'a '(b c)) => (a b c)

Œ‹‰Ê F Ú'±,³,ê,½ƒŠƒXƒg

rplaca

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(rplaca arg1 arg2)　　　　　arg1:list　arg2:all

‹@”\ FƒŠƒXƒgarg1,ÌCAR•”,ðarg2,É’u,«Š·,¦,é Barg1,ðƒRƒs [
　　　,¹,,,Éƒ|ƒCƒ“ƒ^,ð ’,«Š·,¦,Ü,·,Ì,Å A—á,Ì,æ,¤,È•› ì—p
　　　,ª” ¶,µ,Ü,· B’ ˆÓ,µ,Ä,,¾,³,¢ B

—á F(setq abc '((a b) (c d))) => abc
　　(rplaca abc '(e f)) => ((e f) (c d))
　　abc => ((e f) (c d))

Œ‹‰Ê Farg1,ÌCAR•”,ðarg2,É’u,«Š·,¦,½ƒŠƒXƒg

rplacd

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(rplacd arg1 arg2)   arg1:list arg2:all
‹@”\ FƒŠƒXƒgarg1,ÌCDR•”,ðarg2,É'u,«Š·,¦,é Barg1,ðfRƒfs [
     ,¹,,,Éƒ|ƒCƒ“ƒ^,ð ’,«Š·,¦,Ü,·,Ì,Å A—á,Ì,æ,¤,È•›,ì—p
     ,ª” ¶,µ,Ü,·, B’ ˆÓ,µ,Ä,,¾,³,¢ B
—á F(setq abc '((a b) (c d))) => abc
     (rplacd abc '((e f)) => ((a b) (e f))
     abc => ((a b) (e f))
Œ‹‰Ê Farg1,ÌCDR•”,ðarg2,É'u,«Š·,¦,½ƒŠƒXƒg

car,first

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(car arg)　　　　arg:list
　　(first arg)　　　　arg:list

‹@”\ FƒŠƒXƒgarg,©,ç Å ‰,Ì—v‘f,ðŽæ,è o,· B

—á F(car '(a b))　 => a
　　(first '((a b) c d)) => (a b)
　　(car 'a) => nil

Œ‹‰Ê FƒŠƒXƒgarg,Ì Å ‰,Ì—v‘f

cdr

ƒ^ƒCƒv␍FSUBRŠÖ␍"

␍'Ž®␍F(cdr arg)　　　　arg:list

‹@"\␍FƒŠƒXƒgarg,©,ç␍Å␍‰,Ì—v‘f,ðŽæ,è␍œ,¢,½Žc,è,ÌƒŠƒXƒg,ð
　　‹␍,ß,é␍B

—á␍F(cdr '(a b))　　=> (b)
　　(cdr '((a b) (c) d)) => ((c) d)
　　(cdr 'a) => nil

Œ‹‰Ê␍FƒŠƒXƒgarg,©,ç␍Å␍‰,Ì—v‘f,ðŽæ,è␍œ,¢,½Žc,è,ÌƒŠƒXƒg

c??r

ƒ^ƒCƒv FSUBRŠÖ ”

’Ž® F(caar arg)　　　　arg:list
　　　(cadr arg)　　　　arg:list
　　　(cdar arg)　　　　arg:list
　　　(cddr arg)　　　　arg:list
‹@” \ F(caar arg),Í(car(car arg)),Æ“™,µ,¢ B
　　　(cadr arg),Í(car(cdr arg))–”,Í A(**second** arg),Æ“™,µ,¢ B
　　　(cdar arg),Í(cdr(car arg)),Æ“™,µ,¢ B
　　　(cddr arg),Í(cdr(cdr arg)),Æ“™,µ,¢ B
Œ‹‰Ê F ã‹L‰‰ŽZŒ‹‰Ê

c???r

ƒ^ƒCƒv␣FSUBRŠÖ␣"

␣'Ž®␣F(caaar arg)   arg:list
      (caadr arg)   arg:list
      (cadar arg)   arg:list
      (caddr arg)   arg:list
      (cdaar arg)   arg:list
      (cdadr arg)   arg:list
      (cddar arg)   arg:list
      (cdddr arg)   arg:list
‹@"\␣F(caaar arg),Í(car(car(car arg))),Æ""™,µ,¢␣B
      (caadr arg),Í(car(car(cdr arg))),Æ""™,µ,¢␣B
      (cadar arg),Í(car(cdr(car arg))),Æ""™,µ,¢␣B
      (caddr arg),Í(car(cdr(cdr arg)))–",Í␣A(**third** arg),Æ""™,µ,¢␣B
      (cdaar arg),Í(cdr(car(car arg))),Æ""™,µ,¢␣B
      (cdadr arg),Í(cdr(car(cdr arg))),Æ""™,µ,¢␣B
      (cddar arg),Í(cdr(cdr(car arg))),Æ""™,µ,¢␣B
      (cdddr arg),Í(cdr(cdr(cdr arg))),Æ""™,µ,¢␣B
Œ‹‰Ê␣F␣ã‹L‰‰ŽZŒ‹‰Ê

c????r

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(caaaar arg)   arg:list
        (caaadr arg)   arg:list
        (caadar arg)   arg:list
        (caaddr arg)   arg:list
        (cadaar arg)   arg:list
        (cadadr arg)   arg:list
        (caddar arg)   arg:list
        (cadddr arg)   arg:list
        (cdaaar arg)   arg:list
        (cdaadr arg)   arg:list
        (cdadar arg)   arg:list
        (cdaddr arg)   arg:list
        (cddaar arg)   arg:list
        (cddadr arg)   arg:list
        (cdddar arg)   arg:list
        (cddddr arg)   arg:list
 ‹@”\ F(caaaar arg),Í(car(car(car(car arg)))),Æ“™,µ,¢ B
        (caaadr arg),Í(car(car(car(cdr arg)))),Æ“™,µ,¢ B
        (caadar arg),Í(car(car(cdr(car arg)))),Æ“™,µ,¢ B
        (caaddr arg),Í(car(car(cdr(cdr arg)))),Æ“™,µ,¢ B
        (cadaar arg),Í(car(cdr(car(car arg)))),Æ“™,µ,¢ B
        (cadadr arg),Í(car(cdr(car(cdr arg)))),Æ“™,µ,¢ B
        (caddar arg),Í(car(cdr(cdr(car arg)))),Æ“™,µ,¢ B
        (cadddr arg),Í(car(cdr(cdr(cdr arg))))–”,Í A(**_fourth_** arg)
,Æ“™,µ,¢ B
        (cdaaar arg),Í(cdr(car(car(car arg)))),Æ“™,µ,¢ B
        (cdaadr arg),Í(cdr(car(car(cdr arg)))),Æ“™,µ,¢ B
        (cdadar arg),Í(cdr(car(cdr(car arg)))),Æ“™,µ,¢ B
        (cdaddr arg),Í(cdr(car(cdr(cdr arg)))),Æ“™,µ,¢ B
        (cddaar arg),Í(cdr(cdr(car(car arg)))),Æ“™,µ,¢ B
        (cddadr arg),Í(cdr(cdr(car(cdr arg)))),Æ“™,µ,¢ B
        (cdddar arg),Í(cdr(cdr(cdr(car arg)))),Æ“™,µ,¢ B
        (cddddr arg),Í(cdr(cdr(cdr(cdr arg)))),Æ“™,µ,¢ B
 Œ‹‰Ê F ã‹L‰‰ŽZŒ‹‰Ê

second

ƒ^ƒCƒv FSUBRŠÖ ”
 ‘Ž® F(second arg)   arg:list
‹@”\ FƒŠƒXƒfgarg,©,ç2”Ô–Ú,Ì—v‘f,ðŽæ,è o,· B
     arg,ª2,æ,è’Z,¢ ê ‡,Í AniI,ð•Ô,· B
—á F(second '(1 2 3 4 5 6 7 8 9 0))   => 2
     (second '(1)) => nil
Œ‹‰Ê FƒŠƒXƒfgarg,Ì2”Ô–Ú,Ì—v‘f–”,ÍniI

third

ƒ^ƒCƒvⓊFSUBRŠÖ⬚"

⬚'Ž®⬚F(third arg)　　　　arg:list

‹@"\⬚FƒŠƒXƒgarg,©,ç3"Ô–Ú,Ì—v'f,ðŽæ,è⬚o,·⬚B
　　arg,ª3,æ,è'Z,¢⬚ê⬚‡,Í⬚Anil,ð•Ô,·⬚B

—á⬚F(third '(1 2 3 4 5 6 7 8 9 0))　　=> 3
　　(third '(1 2)) => nil

Œ‹‰Ê⬚FƒŠƒXƒgarg,Ì3"Ô–Ú,Ì—v'f–",Ínil

fourth

ƒ^ƒСƒv□FSUBRŠÖ□"

□'Ž®□F(fourth arg)　　　　arg:list

‹@"\□FƒŠƒXƒgarg,©,ç4"Ô–Ú,Ì—v'f,ðŽæ,è□o,·□B

　　arg,ª4,æ,è'Z,¢□ê□‡,Í□Anil,ð•Ô,·□B

—á□F(fourth '(1 2 3 4 5 6 7 8 9 0))　　=> 4

　　(fourth '(1 2 3)) => nil

Œ‹‰Ê□FƒŠƒXƒgarg,Ì4"Ô–Ú,Ì—v'f–",Ínil

fifth

ƒ^ƒCƒv␣FSUBRŠÖ␣"

␣'Ž®␣F(fifth arg)　　　arg:list

‹@"\␣FƒŠƒXƒgarg,©,ç5"Ô–Ú,Ì—v'f,ðŽæ,è␣o,·␣B

　　arg,ª5,æ,è'Z,¢␣ê␣‡,Í␣Anil,ð•Ô,·␣B

—á␣F(fifth '(1 2 3 4 5 6 7 8 9 0))　=> 5

　　(fifth '(1 2 3 4)) => nil

Œ‹‰Ê␣FƒŠƒXƒgarg,Ì5"Ô–Ú,Ì—v'f–",Ínil

sixth

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(sixth arg)　　　arg:list

‹@”\ FƒŠƒXƒfgarg,©,ç6”Ô–Ú,Ì—v‘f,ðŽæ,è o,· B

　　arg,ª6,æ,è’Z,¢ ê ‡,Í Anil,ð•Ô,· B

—á F(sixth '(1 2 3 4 5 6 7 8 9 0))　　=> 6

　　(sixth '(1 2 3 4 5)) => nil

Œ‹‹‰Ê FƒŠƒXƒfgarg,Ì6”Ô–Ú,Ì—v‘f–”,Ínil

seventh

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(seventh arg)   arg:list

‹@”\ FƒŠƒXƒgarg,©,ç7”Ô–Ú,Ì—v‘f,ðŽæ,è o,· B
      arg,ª7,æ,è’Z,¢ ê ‡,Í Anil,ð•Ô,· B

—á F(seventh '(1 2 3 4 5 6 7 8 9 0))   => 7
      (seventh '(1 2 3 4 5 6)) => nil

Œ‹‰Ê FƒŠƒXƒgarg,Ì7”Ô–Ú,Ì—v‘f–”,Ínil

eighth

ƒ^ƒCƒv FSUBRŠÖ”

 ’Ž® F(eighth arg)   arg:list

‹@”\ FƒŠƒXƒgarg,©,ç8”Ô–Ú,Ì—v‘f,ðŽæ,è o,· B
     arg,ª8,æ,è’Z,¢ ê ‡,Í Anil,ð•Ô,· B

—á F(eighth '(1 2 3 4 5 6 7 8 9 0))   => 8
     (eighth '(1 2 3 4 5 6 7)) => nil

Œ‹‹‰Ê FƒŠƒXƒgarg,Ì8”Ô–Ú,Ì—v‘f–”,Ínil

ninth

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(ninth arg)   arg:list

‹@”\ FƒŠƒXƒfgarg,©,ç9”Ô–Ú,Ì—v‘f,ðŽæ,è o,· B
     arg,ª9,æ,è’Z,¢ ê ‡,Í Anil,ð•Ô,· B

—á F(ninth '(1 2 3 4 5 6 7 8 9 0))   => 9
     (ninth '(1 2 3 4 5 6 7 8)) => nil

Œ‹‰Ê FƒŠƒXƒfgarg,Ì9”Ô–Ú,Ì—v‘f–”,Ínil

tenth

ƒ^ƒCƒv␣FSUBRŠÖ␣"

␣'Ž®␣F(tenth arg)　　　　　arg:list

‹@"\␣FƒŠƒXƒgarg,©,ç10"Ô–Ú,Ì—v'f,ðŽæ,è␣o,·␣B

　　arg,ª10,æ,è'Z,¢␣ê␣‡,Í␣Anil,ð•Ô,·␣B

—á␣F(tenth '(1 2 3 4 5 6 7 8 9 0))　=> 0

　　(tenth '(1 2 3 4 5 6 7 8 9)) => nil

Œ‹‰Ê␣FƒŠƒXƒgarg,Ì10"Ô–Ú,Ì—v'f–",Ínil

nth

ƒ^ƒCƒv　FSUBRŠÖ　”

　’Ž®　F(nth arg1 arg2)　arg1:number　arg2:list

‹@”\　FƒŠƒXƒgarg2,©,ç(arg1+1)”Ô–Ú,Ì—v‘f,ðŽæ,è　o,·　B

　　　arg2,ª(arg1+1),æ,è’Z,¢　ê　‡,Í　AniI,ð•Ô,·　B

—á　F(nth 5 '(1 2 3 4 5 6 7 8 9 0))　　=> 6

Œ‹‰Ê　FƒŠƒXƒgarg2,Ì(arg1+1)”Ô–Ú,Ì—v‘f–”,ÍniI

nthcdr

ƒ^ƒCƒv FSUBRŠÖ”

Ž®F(nthcdr arg1 arg2)　　arg1:number　arg2:list

‹@”\ FƒŠƒXƒgarg2,©,ç(arg1+1)”Ô–Ú,Ü,Å,Ì—v‘f,ðŽæ,è œ,¢,½
Žc,è,ÌƒŠƒXƒg,ð•Ô,· Barg2,ª(arg1+1),æ,è’Z,¢ê ‡,Í A
nil,ð•Ô,· B

—á F(nthcdr 5 '(1 2 3 4 5 6 7 8 9 0))　　=> (7 8 9 0)

Œ‹‰Ê FƒŠƒXƒgarg2,©,ç(arg1+1)”Ô–Ú,Ü,Å,Ì—v‘f,ðŽæ,è œ,¢,½
Žc,è,ÌƒŠƒXƒg–”,Ínil

list

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(list arg1 arg2 ...)   arg:all

‹@"\□Farg1,arg2...,ð□‡"Ô,ÉŽÀ□s,µ□A,»,ê,ç,ÌƒŠƒXƒg,ð‹□,ß,é□B

—á□F(list 1 "abc" 'a (+ 1 2))   => (1 abc a 3)

Œ‹‰Ê□FŽÀ□sŒ‹‰Ê,ðƒŠƒXƒg,É,µ,½,à,Ì

assoc

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(assoc arg1 arg2)   arg1:list   arg2:atom

‹@”\ FƒŠƒXƒgarg1,ÌŠe—v‘f,ÌCAR•”,ðƒAƒgƒ€arg2,Æ”äŠr,µ A^ê’v

   ,·,ê,Î,»,Ì—v‘f,ð•Ô,· BŒ©,Â,©,ç,È,©,Á,½,çnil,ð•Ô,· B

—á F(assoc '((a 1) (b 2) (c 3)) 'b)   => (b 2)

Œ‹‰Ê Farg2,Æˆê’v,µ,½—v‘f–”,Ínil

pair

ƒ^ƒCƒv FSUBRŠÖ"

’Ž® F(pair arg1 arg2) arg1:list arg2:list

‹@" FƒŠƒXƒfgarg1,ÌŠe—v'f,ÆƒŠƒXƒfgarg2,ÌŠe—v'f,ð **cons** ,µ A
,»,ê,ç,ðƒŠƒXƒfg,É,µ,½,à,Ì,ð•Ô,·B

—á F(pair '(a (b c) d) '(1 2 (3 4)))
=> ((a . 1) ((b c) . 2) (d 3 4))

Œ‹‰Ê F,»,ê,¼,ê,Ì—v'f,ðcons,µ,½,à,Ì,ÌƒŠƒXƒfg

append

ƒ^ƒCƒv□FSUBRŠÖ□”

□'Ž®□F(append arg1 arg2)   arg1:list   arg2:list

‹@”\□F,Q,Â,ÌƒŠƒXƒfgarg1,Æarg2,ð,Â,È,°,Ä,P,Â,ÌƒŠƒXƒfg,É,·,é□B
      ,È,¨□Aarg1,Í __copy__ ,³,ê,Ä,©,ç,Â,È,°,ç,ê,Ü,·□B

—á□F(setq abc '(a b))   => abc
    (append abc '(c d)) => (a b c d)
    abc => (a b)

Œ‹‰Ê□Farg1,ðƒRƒs□[,µ,½,à,Ì,Éarg2,ð,Â,È,¢,¾ƒŠƒXƒfg

nconc

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(nconc arg1 arg2)　　　　　arg1:list　arg2:list

‹@”\ F,Q,Â,ÌfŠƒXƒgarg1,Æarg2,ð,Â,È,°,Ä,P,Â,ÌfŠƒXƒfg,É,·,é B

　　,È,¨ Aarg1,Í **copy** ,³,ê,¸,É,Â,È,°,ç,ê,Ü,· B,»,Ì,½,ß,É—á,Ì,æ,¤,È

　　–â‘è,ª”¶¶,µ,Ü,· B

—á F(setq abc '(a b))　　=> abc
　　(nconc abc '(c d)) => (a b c d)
　　abc => (a b c d)

Œ‹‰Ê Farg1,ðfRfs [,¹,¸,Éarg2,ð,Â,È,¢,¾fŠƒXƒfg

copy

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(copy arg1)   arg1:all

‹@”\ Farg1,Ì•¡ »,ð ì,é B

—á F(copy '(a b))   => (a b)

     (setq abc '(a b)) => abc

     (eq abc (copy abc)) => nil

Œ‹‰Ê Farg1,ðƒRƒs [,µ,½,à,Ì

reverse

ƒ^ƒCƒv⊡FSUBRŠÖ⊡”

⊡'Ž®⊡F(reverse arg1)   arg1:list

‹@”\⊡FƒŠƒXƒfgarg1,Ì—v'f,Ì⊡‡⊡˜,ð‹t,É,µ,½ƒŠƒXƒfg,ð‹⊡,ß,é⊡B

　　arg1,ªƒŠƒXƒfg,Å,È,¢⊡ê⊡‡,Í⊡Aarg1,ð•Ó,·⊡B

—á⊡F(reverse '(a b (c d)))   => ((c d) b a)

Œ‹‰Ê⊡Farg1,ð‹t⊡‡,É,µ,½ƒŠƒXƒfg

last

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(last arg1)　　　　arg1:list

‹@”\ FƒŠƒXƒfgarg1,ì ÅŒã,ì—v‘f,ì,Ý,ìƒŠƒXƒfg,ð•Ô,· Barg1,ª
　　　ƒŠƒXƒfgˆÈŠO,ì ê ‡,Ínil,ð•Ô,· B

—á F(last '(a b c d))　　=> (d)

Œ‹‰Ê Farg1,ì ÅŒã,ì—v‘f,ì,Ý,ìƒŠƒXƒfg

delete

ƒ^ƒCƒv FSUBRŠÖ ”

‘Ž® F(delete arg1 arg2)　　　　arg1:all　arg2:list

‹@”\ FƒŠƒXƒgarg2,©,çarg1,ðŽæ,è œ,¢,½ƒŠƒXƒg,ð‹ ,ß,é B

—á F(delete 'a '(a b c a)) => (b c)

　　(delete '(a b) '((a b)(a b))) => nil

Œ‹‰Ê Farg2,©,çarg1,ðŽæ,è œ,¢,½ƒŠƒXƒg

subst

 ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(subst arg1 arg2 arg3)　arg1:all　arg2:all　arg3:list

 ‹@”\ FƒŠƒXƒgarg3,Éarg2,ªŠÜ,Ü,ê,Ä,¢,½ ê ‡ Aarg1,É’uŠ·,·,é B

 —á F(subst 'x 'b '(a b c a b c)) => (a x c a x c)

 Œ‹‰Ê Farg3,Ìarg2,ðarg1,É’uŠ·,µ,½ƒŠƒXƒg

read

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(read)

‹@”\ FƒL [ƒ{ [ƒh,©,ç“ü—Í,³,ê,½•¶Žš—ñ,ðƒAƒgƒ€,âƒŠƒXƒg,Æ
　　,µ,Ä“Ç,Ý ž,Þ B

Œ‹‰Ê FƒL [ƒ{ [ƒh,©,ç“ü—Í,³,ê,½ƒAƒgƒ€,âƒŠƒXƒg

sread

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(sread)

‹@”\ FƒL [ƒ{ [ƒh,©,çü—Í,³,ê,½•¶Žš—ñ,ð•¶Žš—ñ,Æ,µ,Ä“Ç,Ý
       ž,Þ BŠÖ ” **s2l** ,ð—p,¢,é,ÆƒAƒgƒ€,âƒŠƒXƒg,É•ÏŠ·,Å,«,é B

Œ‹‰ÊƒFƒL [ƒ{ [ƒh,©,çü—Í,³,ê,½•¶Žš—ñ

print

ƒ^ƒCƒv□FSUBRŠÖ□”

□'Ž®□F(print arg1)　　　arg1:all

‹@”\□Farg1,ðƒƒƒBƒXƒvƒŒƒC,É•\Ž¦,µ□A‰ü□s,·,é□B

Œ‹‰Ê□Farg1

princ

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(princ arg1)　　　arg1:all

‹@”\ Farg1,ðƒffƒBƒXƒvƒŒƒC,É•\Ž¦,·,é B‰ü s,Í,µ,È,¢ B

Œ‹‰Ê Farg1

openr

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(openr arg1)　　arg1:string

‹@”\ Fftƒ@ƒCƒ‹arg1,ð“Ç,Ý ž,Ý ê—p,ÅfI [ƒvƒ“,·,é B,±,ÌŠÖ ”,Å•Ô,³,ê,é
　　ftƒ@ƒCƒ‹“Ô †,Í Aff [ƒ^,ð“Ç,Ý,¾,µ,½,è 　**close**　 ,·,é Û,É•K—v
　　,Æ,È,è,Ü,·,Ì,Å A•K, ̧•Ï ”,É‘Ò”ð,µ,Ä,¨,,±,Æ B

—á F(setq fp (openr "test")) => fp
　　(fread fp) => ftƒ@ƒCƒ‹test,Ì Å ‰,ÌƒAƒgƒf€–”,ÍƒŠƒXƒg
　　(close fp) => t

Œ‹‰Ê Fftƒ@ƒCƒ‹“Ô †

openw

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(openw arg1)　　arg1:string

‹@”\ Fƒtƒ@ƒCƒ‹arg1,ð ‘,« ž,Ý ê—p,Å ƒI [ƒvƒ“,·,é B,±,ÌŠÖ ”,Å•Ô,³,ê,é
　　ƒtƒ@ƒCƒ‹”Ô †,Í Aƒff [ƒ^,ð ‘,« ž,ñ,¾,è　**close**　,·,é Û,É•K—v
　　,Æ,È,è,Ü,·,Ì,Å A•K, ,•Ï ”,É‘Ò”ð,µ,Ä,¨,,±,Æ B

—á F(setq fp (openw "test")) => fp
　　(fprint fp '(a b)) => (a b)　　ƒtƒ@ƒCƒ‹test,É(a b),ª o—Í,³,ê,é
　　(close fp) => t

Œ‹‰Ê Fƒtƒ@ƒCƒ‹”Ô †

close

ƒ^ƒCƒv FSUBRŠÖ"

‘Ž® F(close arg1)　　arg1:number

‹@"\ F **openr** –",Í **openw** ,ÅƒI [ƒvƒ"³,ê,½ƒtƒ@ƒCƒ‹,ðƒNƒ [ƒY,·,é B
　　³ í,ÉƒNƒ [ƒY o—ˆ,½Žž,Ít A o—ˆ,È,©,Á,½Žž,Ínil,ð•Ô,· B

—á F(setq fp (openw "test")) => fp
　　(fprint fp '(a b)) => (a b)　　ƒtƒ@ƒCƒ‹‹test,É(a b),ª o—Í,³,ê,é
　　(close fp) => t

Œ‹‰Ê F t–",Ínil

fread

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(fread arg1)　　arg1:number

‹@”\ F　**openr**　,ÅƒI [ƒvƒ“,³,ê,½ƒtƒ@ƒCƒ‹(ƒtƒ@ƒCƒ‹“Ô †arg1),©,ç
　　　ƒAƒgƒ€,âƒŠƒXƒg,ð“Ç,Ý ž,Þ Bƒtƒ@ƒCƒ‹,Ì ÅŒã,É’B,µ,½ ê ‡ A
　　　nil,ð•Ô,· B

—á F(setq fp (openr "test")) => fp
　　(fread fp) => ƒtƒ@ƒCƒ‹‹test,Ì Å ‰,ÌƒAƒgƒ€–”,ÍƒŠƒXƒg
　　(close fp) => t

Œ‹‰Ê Fƒtƒ@ƒCƒ‹‹arg1,©,ç“Ç,Ý ž,ñ,¾ƒAƒgƒ€,âƒŠƒXƒg

freads

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(freads arg1)　　arg1:number

‹@"\□F　**openr**　,Åƒl□[ƒvƒ",³,ê,½ƒtƒ@ƒCƒ‹(ƒtƒ@ƒCƒ‹"Ô□†arg1),©,ç
　　　ˆê□s•ª,Ìff□[ƒ^,ð•¶Žš—ñ,Æ,µ,Ä"Ç,Ý□ž,Þ□B‰ü□s,Í"Ç,Ý□ž,Ü,È,¢□B
　　　ƒtƒ@ƒCƒ‹,Ì□ÅŒã,É'B,µ,½□ê□‡□Anil,ð•Ô,·□B
　　　ŠÖ□"　**s2l**　,ð—p,¢,é,ÆƒAƒgƒf€,âƒŠƒXƒg,É•ÏŠ·,Å,«,é□B

—á□F(setq fp (openr "test")) => fp
　　　(freads fp) => ƒtƒ@ƒCƒ‹‹test,Ì□Å□‰,Ìˆê□s•ª,Ìff□[ƒ^
　　　(close fp) => t

Œ‹‰Ê□Fƒtƒ@ƒCƒ‹‹arg1,©,ç"Ç,Ý□ž,ñ,¾•¶Žš—ñ

freadc

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(freadc arg1)　　arg1:number

‹@”\ F　**openr**　,ÅƒI [ƒvƒ“,³,ê,½ƒtƒ@ƒCƒ‹(ƒtƒ@ƒCƒ‹‹”Ô †arg1),©,ç
　　　,PƒoƒCƒg•ª,Ìff [ƒ^,ð ”’I,Æ,µ,Ä“Ç,Ý ž,Þ Bƒtƒ@ƒCƒ‹,Ì
　　　 ÅŒã,É’B,µ,½ ê ‡ Anil,ð•Ô,·B

—á F(setq fp (openr "test")) => fp
　　(freadc fp) => ƒtƒ@ƒCƒ‹‹test,Ì Å ‰‰,Ì,PƒoƒCƒg,Ìff [ƒ^
　　(close fp) => t

Œ‹‰ÊÊFƒtƒ@ƒCƒ‹‹arg1,©,ç“Ç,Ý ž,ñ,¾,PƒoƒCƒgff [ƒ^,Ì’I

fprint
　ƒ^ƒCƒvￚFSUBRŠÖￚ”
　ￚ'Ž®ￚF(fprint arg1 arg2)　　　arg1:number arg2:all
　‹@”\ￚF　**openw**　,ÅfIￚ[fvƒ",³,ê,½ftƒ@ƒCƒ‹(ftƒ@ƒCƒ‹"Ôￚ†arg1),É
　　　　arg2,ðￚo—Í,µￚA‰üￚs,·,éￚB
　—áￚF(setq fp (openw "test")) => fp
　　　(fprint fp '(a b)) => (a b)　　ftƒ@ƒCƒ‹‹test,É(a b),ªￚo—Í,³,ê
　　　　　　　　　　　　　　　　‰üￚs,³,ê,éￚB
　　　　(close fp) => t
　Œ‹‰ÊￚFarg2

fwrites

ƒ^ƒCƒv FSUBRŠÖ ”

’Ž® F(fwrites arg1 arg2)　　arg1:number arg2:string

‹@”\ F　**openw**　,ÅﬂI [ƒvƒ“,³,ê,½ﬁﬂ@ƒCƒ‹(ﬁﬂ@ƒCƒ‹‹”Ô †arg1),É

　　•¶Žš—ñarg2,ð o—Í,·,é B　**fprint**　,ÆˆÙ,È,è

　　",â‰ü sﬁR [ﬁh,Í o—Í,³,ê,È,¢ B

—á F(setq fp (openw "test")) => fp

　　(fwrites fp "abc") => abc　　ﬁﬂ@ƒCƒ‹‹test,Éabc,ª o—Í,³,ê,é

　　(close fp) => t

Œ‹‹‰Ê Farg2

fwritec

ƒ^ƒCƒv FSUBRŠÖ "

 'Ž® F(fwritec arg1 arg2)   arg1:number arg2:number,string

‹@"\ F   **openw**   ,ÅƒI [ƒvƒ",³,ê,½ƒtƒ@ƒCƒ‹(ƒtƒ@ƒCƒ‹‹"Ô †arg1),É
      arg2,ª•¶Žš—ñ,È,ç,Î A Å ‰,Ì,PƒofCƒg,ð o—Í,·,é B
      rag2,ª "Žš,È,ç A,»,Ì "Žš,ª•\,·•¶ŽšƒR [ƒh,ð o—Í,·,é B

—á F(setq fp (openw "test")) => fp
     (fwritec fp "abc") => abc   ƒtƒ@ƒCƒ‹test,Éa,ª o—Í,³,ê,é
     (fwritec fc 88) => 88   ƒtƒ@ƒCƒ‹test,ÉX,ª o—Í,³,ê,é
     (close fp) => t

Œ‹‰Ê Farg2

load

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž®　F(load arg1)　　　arg1:string

‹@”\ Fƒtƒ@ƒCƒ‹arg1,©,çfAfgf€–”,ÍfŠƒXƒg,ð“Ç,Ý ž,Ý A•]‰¿,·,é B
　　ˆê”Ê“I,É,Í ALISP,Ìfvƒ ƒOf‰ƒ€,ðƒtƒ@ƒCƒ‹,©,ç“Ç,Ý ž,ÝŽÀ s,·,é B

Œ‹‰Ê Ft

cd

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(cd arg)　arg:string

‹@”\ Farg,ÅŽ¦,³,ê,éƒfƒXƒN‹y,ÑƒfƒŒƒNƒgƒŠ,É^Ú“®,·,é B

　　arg,É‘Š“–,·,éƒfƒXƒN,âƒfƒŒƒNƒgƒŠ,ª‘¶ Ý,µ,È,¢ ê ‡
　　,Ínil,ð•Ô,· B

—á F(cd "..") => ..

Œ‹‰Ê Farg–”,Ínil(ƒfƒXƒN,âƒfƒŒƒNƒgƒŠ,Ì^Ú“®,ÉŽ¸”s,µ,½Žž)

dir

ƒ^ƒCƒv￭FSUBRŠÖ￭"

￭'Ž®￭F(dir arg)　arg:string

‹@"\￭Farg,ÅŽw'è,³,ê,½ƒtƒ@ƒCƒ‹‹–¼,ðƒŠƒXƒg,É,·,é￭B,È,¨￭Aƒtƒ@
　　ƒCƒ‹‹–¼,Ístring,Æ,µ,Ä"Ç,Ý￭ž,Ü,ê,é￭B

—á￭F(dir "yool.*") => (yool.exe yool.hlp)

Œ‹‰Ê￭Fƒtƒ@ƒCƒ‹‹–¼(string),ÌƒŠƒXƒg

plus,+

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(plus arg1 arg2 ...)   arg:number
      (+ arg1 arg2 ...)   arg:number

‹@”\ F‘S,Ä,Ì^ø,« ”,Ì‘ ˜a,ð‹ ,ß,é B

—á F(plus 1.23 -4.56 7.89) => 4.56
     (+ 1 2 3 4 5) => 15

Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”’I

difference,-

ƒ^ƒCƒv FSUBRŠÖ ”

 'Ž® F(difference arg1 arg2 ...)   arg:number
       (- arg1 arg2 ...)   arg:number

‹@”\ Farg1,©,çarg2ˆÈ ~,Ì'l,ðˆø,¢,½'l,ð‹ ,ß,é B

—á F(difference 1.23 4.56 7.89) => -11.22
      (- 1 2 3 4 5) => -13

Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”'l

times,*

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(times arg1 arg2 ...)　arg:number
　　 (* arg1 arg2 ...)　arg:number

‹@”\ F'S,Ä,Ì^ø,« ”,ðŠ|,¯ŽZ,·,é B

—á F(times 2 3 4) => 24
　　 (* 0.1 23 -1) => -2.3

Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”’I

quotient,/

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(quotient arg1 arg2 ...)   arg:number
        (/ arg1 arg2 ...)   arg:number

‹@"\□Farg1,ð□Aarg2ˆÈ□~,Ì'I,ÅŠ"„,é□B

—á□F(quotient 48 2 3) => 8
      (/ 123 3 -4) => -10.25

Œ‹‰Ê□F‰‰ŽZŒ‹‰Ê,Ì□"'I

remainder,%

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(remainder arg1 arg2) arg:number
    (% arg1 arg2)   arg:number

‹@”\ Farg1,ð Aarg2ˆÈ ~,Ì'I,ÅŠ„,Á,½Žž,Ì—],è,ð‹ ,ß,é B
   ,È,¨ A^ø ”,ª ¬ ”“_ˆÈ‰º,Ì'I,ðŽ ,Â ê ‡,Í ® ”•”,Ì,ÝŽg—p
   ,µ,Ä‰‰ŽZ,³,ê,é B

—á F(remainder 38 5) => 3
  (% -38 5) => -3
  (% 98.765 10.12) => 8   (% 98 10),Æ“¯,¶
Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”'I

divide

ƒ^ƒCƒv⯀FSUBRŠÖ⯀”

⯀'Ž®⯀F(divide arg1 arg2)   arg:number

‹@”\⯀Farg1‚ð⯀Aarg2ˆÈ⯀~‚Ì'I‚ÅŠ„‚‚Á‚½Žž‚Ì⯀¤‚Æ—]‚è‚ð‹⯀‚ß‚é⯀B
    (⯀¤ . —]‚è)‚ÌŒ`‚ÅƒŠƒXƒg‚Æ‚µ‚Ä•Ô‚³‚ê‚é⯀B
    ‚È‚¨⯀Aˆ ø⯀”‚º⯀¬⯀”” ‘ˆÈ‰º‚Ì'I‚ðŽ⯀‚Â⯀ê⯀‡‚Í⯀®⯀”•”‚Ì‚ÝŽg—p
    ‚µ‚Ä‰‰ŽZ‚³‚ê‚é⯀B

—á⯀F(divide 123 10) => (12 . 3)
    (divide 47.98 10.2) => (4 . 7)   (divide 47 10)‚Æ“¯‚¶
Œ‹‰Ê⯀F(⯀¤ . —]‚è)‚ÌŒ`‚ÌƒŠƒXƒg

abs

ƒ^ƒCƒv￼FSUBRŠÖ￼"

￼'Ž®￼F(abs arg1)arg:number

‹@"\￼Farg1,Ì'I,ª•‰,Ì￼",È,ç￼³,Ì'I,É•Ï,¦,é￼B

—á￼F(abs -12.3) => 12.3

Œ‹‰Ê￼F‰‰ŽZŒ‹‰Ê,Ì￼"'I

random

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(random arg)　　arg:number

‹@"\□F0□`arg-1,ÌŠÔ,Ì"K"–,È□®□"(—□□"),ð•Ô,·□B

—á□F(random 1000) => 0□`999,ÌŠÔ,Ì—□□"

Œ‹‰Ê□F‰%‰ŽZŒ‹‰Ê,Ì□"'I

sin

ƒ^ƒCƒv⯑FSUBRŠÖ⯑”

⯑'Ž®⯑F(sin arg)　arg:number

‹@”\⯑Farg,Ìsin,Ì'I,ð‹⯑,ß,é⯑B,È,¨⯑Aarg,Ì'PˆÊ,Íƒ‰ƒWƒAƒ“,Å,·⯑B

—á⯑F(sin (/ 3.1416 4)) => 0.707108

Œ‹‰Ê⯑F‰‰ŽZŒ‹‰Ê,Ì⯑”'I

cos

ƒ^ƒCƒv￼FSUBRŠÖ￼"

￼'Ž®￼F(cos arg)　arg:number

‹@"\￼Farg,Ìcos,Ì'I,ð‹￼,ß,é￼B,È,¨￼Aarg,Ì'PˆÊ,Íƒ‰ƒWƒAƒ",Å,·￼B

—á￼F(cos (/ 3.1416 4)) => 0.707108

Œ‹‰Ê￼F‰‰ŽZŒ‹‰Ê,Ì￼"'I

tan

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(tan arg)　arg:number

‹@"\□Farg,Ìtan,Ì'l,ð‹□,ß,é□B,È,¨□Aarg,Ì'PˆÊ,Íƒ‰ƒWƒAƒ",Å,·□B

―á□F(tan (/ 3.1416 4)) => 1

Œ‹‰Ê□F‰‰ŽZŒ‹‰Ê,Ì□"'l

asin

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(asin arg) arg:number

‹@”\ Farg,ìarcsin(sin,Ì‹tŠÖ ”),Ì’l,ð‹ ,ß,é B,È,¨ AŒ‹‰Ê,Ì
　　’PˆÊ,Íƒ‰ƒWƒAƒ“,Å,· B

—á F(asin 0.707108) => 0.7854   (/ 3.1416 4),Æ“¯,¶
Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”’l

acos

ƒ^ƒCƒv⬚FSUBRŠÖ⬚"

⬚'Ž®⬚F(acos arg) arg:number

‹@"\⬚Farg,Ìarccos(cos,Ì‹tŠÖ⬚")),Ì'I,ð‹⬚,ß,é⬚B,È,¨⬚AŒ‹‰Ê,Ì
　　'PˆÊ,Íƒ‰ƒWƒAƒ",Å,·⬚B

—á⬚F(acos 0.707108) => 0.7854　　(/ 3.1416 4),Æ"¯,¶
Œ‹‰Ê⬚F‰‰ŽZŒ‹‰Ê,Ì⬚"'I

atan

ƒ^ƒCƒv⃞FSUBRŠÖ⃞”

⃞'Ž®⃞F(atan arg) arg:number

‹@”\⃞Farg,Ìarctan(tan,Ì‹tŠÖ⃞”),Ì'I,ð‹⃞,ß,é⃞B,È,¨⃞AŒ‹‰Ê,Ì
'PˆÊ,Íƒ‰ƒWƒAƒ“,Å⃞A-ƒÎ/2⃞`ƒÎ/2,ÌŠÔ,Ì'I,Å,·⃞B

—á⃞F(atan 1) => 0.7854   (/ 3.1416 4),Æ“¯,¶
Œ‹‰Ê⃞F‰‰ŽZŒ‹‰Ê,Ì⃞”’I

expt

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(expt arg1 arg2)arg:number

‹@"\□Farg1,Ìarg2□æ,Ì'I,ð‹□,ß,é□B

—á□F(expt 2 3) => 8

   (expt 0.1 2) => 0.01

Œ‹‰Ê□F‰‰ŽZŒ‹‰Ê,Ì□"'I

exp

ƒ^ƒCƒv␣FSUBRŠÖ␣"

␣'Ž®␣F(exp arg)　arg:number

‹@"\␣Fe(=2.7182…),ìarg␣æ,Ì'l,ð‹␣,ß,é␣B

—á␣F(exp 2) => 7.38906

Œ‹‰Ê␣F‰‰ŽZŒ‹‰Ê,Ì␣"'l

sqrt

ƒ^ƒCƒv FSUBRŠÖ ”

 ʽŽ® F(sqrt arg) arg:number

‹@”\ Farg,Ìƒ‹ ƒfg(‡•),Ì'I,ð‹ ,ß,é B

—á F(sqrt 2) => 1.41421

Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”'I

log

ƒ^ƒCƒv FSUBRŠÖ"

'Ž® F(log arg)   arg:number

‹@"\ Farg,Ìlog,Ì'l,ð‹ ,ß,é B

—á F(log 2.71829) => 1

(/ (log 10000) (log 10)) => 4

Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì "'l

truncate

ƒ^ƒCƒv FSUBRŠÖ ”
 ‘Ž® F(truncate arg)   arg:number
‹@”\ Farg,Ì ® ” •”,Ì’I,ð‹ ,ß,é B
—á F(truncate 12.3456) => 12
     (truncate -12.3456) => -13
Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”’I

float

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(float arg) arg:number

‹@”\ Farg,ª ® ”,Ì ê ‡ A•,“® ¬ ”“_’l,É•Ï X,·,é B

—á F(float 12) => 12

   (float -12) => -12

Œ‹‰Ê F‰‰ŽZŒ‹‰Ê,Ì ”’l

make-array

ƒ^ƒCƒv☐FSUBRŠÖ☐"

☐'Ž®☐F(make-array arg)　　arg:number

‹@"\☐Farg,Ì'å,«,³,Ì"z—ñ,ð☐ì,é☐B,È,¨"z—ñ,Ì☐‰Šú'l,Ínil,Å,·☐B

—á☐F(make-array 2) => #(nil nil)

Œ‹‰Ê☐F☐ì,ç,ê,½"z—ñ

vector

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(vector arg1 arg2 …) arg:all

‹@”\ Fˆø�Œ,Ì ”,Æ“¯,¶‘å,«,³,Ì”z—ñ,ð ì,é B,È,¨”z—ñ,Ì ‰Šú‘l,Í
    arg1 Aarg2…,Å,· B

—á F(vector 1.2 '(a b) "abc") => #(1.2 (a b) abc)

Œ‹‰Ê F ì,ç,ê,½”z—ñ

aref

ƒ^ƒCƒv￮FSUBR ŠÖ￮”

￮'Ž®￮F(aref arg1 arg2) arg1:array　arg2:number

‹@”\￮F”z—ñarg1,Ìarg2”Ô–Ú(”z—ñ,Ì￮Å￮‰,Ìff￮[ƒ^,Í0”Ô–Ú,Å,·￮B)
　　　,Ì'l,ð‹￮,ß,é￮B
　　　,È,¨￮A”z—ñ,É'l,ð'ã"ü,·,é￮ê￮‡,ÍŽŸ,Ì,æ,¤,É,·,é￮B
　　　　　(　**<u>setf</u>**　(aref ”z—ñ ￮”Žš) 'ã"ü,·,é'l)

—á￮F(setq abc (vector 1 2 3 4)) => abc
　　(aref abc 0) => 1
　　(aref abc 3) => 4

Œ‹‰Ê￮F￮ì,ç,ê,½”z—ñ

ascii

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(ascii arg) arg:string

‹@"\□F•¶Žš—ñarg,Ì□Å□‰,Ì•¶Žš,ÌƒAƒXƒL□[ƒR□[ƒh,ð‹□,ß,é□B

—á□F(ascii "ABC") => 65

Œ‹‰Ê□FƒAƒXƒL□[ƒR□[ƒh,Ì□"'I

char

ƒ^ƒCƒv□FSUBRŠÖ□”

□'Ž®□F(char arg) arg:number

‹@”\□FƒAƒXƒL□[ƒR□[ƒharg,É'Š"–,·,é•¶Žš,ð‹□,ß,é□B

—á□F(char 65) => A

Œ‹‰ÊÊ□FƒAƒXƒL□[ƒR□[ƒharg,É'Š"–,·,é•¶Žš

concat

ƒ^ƒCƒv⬚FSUBRŠÖ⬚”

⬚'Ž®⬚F(concat arg1 arg2 ...) arg:string

‹@"\⬚F•¶Žš—ñarg1,arg2...,ð⬚‡"Õ,É,Â,È,°,Ä1,Â,Ì•¶Žš—ñ,É,·,é⬚B

—á⬚F(concat "ABC" "DE" "FGH") => ABCDEFGH

Œ‹‰Ê⬚F,Â,È,ª,ê,½•¶Žš—ñ

glc

ƒ^ƒCƒv FSUBRŠÖ ”

 'Ž® F(glc arg)   arg:string

‹@”\ F•¶Žš—ñarg,Ì ÅŒã,Ì•¶Žš,ð‹ ,ß,é B

—á F(glc "ABC") => C

Œ‹‰Ê F•¶Žš—ñarg,Ì ÅŒã,Ì•¶Žš

gnc

ƒ^ƒCƒv␣FSUBRŠÖ␣”

␣'Ž®␣F(gnc arg) arg:string

‹@”\␣F•¶Žš—ñarg,Ì␣Å␣‰,Ì•¶Žš,ð‹␣,ß,é␣B

—á␣F(gnc "ABC") => A

Œ‹‰Ê␣F•¶Žš—ñarg,Ì␣Å␣‰,Ì•¶Žš

strIng

ƒ^ƒCƒv␀FSUBRŠÖ␀"
␀'Ž®␀F(strIng arg)   arg:string
‹@"\␀F•¶Žš—ñarg,Ì'·,³,ð‹␀,ß,é␀B
—á␀F(strIng "ABCDEFG") => 7
Œ‹‰Ê␀F•¶Žš—ñarg,Ì•¶Žš␀"

s2l

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(s2l arg)   arg:string

‹@”\ F•¶Žš—ñarg,ðƒAƒgƒ€,âƒŠƒXƒg,É•ÏŠ·,·,é B

—á F(s2l (sread)) => "ü—Í,³,ê,½•¶Žš—ñ,ðƒAƒgƒ€,âƒŠƒXƒg,É•ÏŠ·

,µ,½,à,Ì(**read** ,Æ"¯,¶)

Œ‹‰Ê F•¶Žš—ñarg,ðƒAƒgƒ€,âƒŠƒXƒg,É•ÏŠ·,µ,½,à,Ì

substr

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(substr arg1 arg2 arg3)　arg1:string　arg2,arg3:number

‹@”\ F•¶Žš—ñarg1,ìarg2”Ô–Ú,Ì•¶Žš,©,çarg3”Ô–Ú,Ü,Å,ðŽæ,è o,· B

—á F(substr "ABCDEFGH" 4 6) => DEF

Œ‹‰Ê Farg2”Ô–Ú,©,çarg3”Ô–Ú,Ü,Å,Ì•¶Žš—ñ

class
 ƒ^ƒCƒv□FSUBRŠÖ□”
 □'Ž®□F(class 'class_name '(
        super_class_name
        ((class_variable1 . initial_value1)
         (class_variable2 . initial_value2)...)
        ((instance_variable1 . initial_value1)
         (instance_variable2 . initial_value2)...)
        ((class_message1 class_method1)
         (class_message2 class_method2)...)
        ((instance_message1 instance_method1)
         (instance_message2 instance_method2)...)
        ))
 ‹@”\□FƒNƒ‰ƒXclass_name,ð'è‹`,·,é□B
 —á□F(class 'stack_class '(
        nil
        ((inst_name))
        ((stack_pointer))
        ((new (lambda(x)(prog()
           (**instance**   **self**   x)
           (setq inst_name (cons x inst_name))
        ))))
        ((push (lambda(x)(setq stack_pointer (cons x stack_pointer))))
         (pop (lambda()(cond ((null stack_pointer)nil)
               (t (prog(tmp)(setq tmp (car stack_pointer))
                  (setq stack_pointer (cdr stack_pointer))
                  (return tmp)))
        ))))
      ))
 Œ‹‰Ê□FƒNƒ‰ƒX–¼

instance

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(instance arg1 arg2)　arg1:class　arg2:symbol

‹@”\ FƒNƒ‰ƒXarg1,ĺƒCƒ“ƒXƒ^ƒ“ƒX,Æ,µ,Äarg2,ð ì,é B

—á F(instance 'stack_class 'stack1) => stack_class

Œ‹‰Ê FƒNƒ‰ƒXarg1

add_cmethod

ƒ^ƒCƒv□FSUBRŠÖ□”

□'Ž®□F(add_cmethod 'class_name '(
        (class_message1 class_method1)
        (class_message2 class_method2)...))

‹@"\□FƒNƒ‰ƒXclass_name,ÌƒNƒ‰ƒXƒ□ƒbƒZ□[ƒW,ð'Ç‰Á,µ,½,è□A
        Šù,É, ,éƒNƒ‰ƒXƒ□ƒbƒZ□[ƒW,Ìƒ□ƒ\ƒbƒh,ð•Ï□X,·,é□B

—á□F(add_cmethod 'stack_class '(
        (show_all_stack (lambda()inst_name))
    ))

Œ‹‰Ê□FƒNƒ‰ƒXclass_name

add_imethod

ƒ^ƒCƒv⬚FSUBRŠÖ⬚”

⬚'Ž®⬚F(add_imethod 'class_name '(
        (instance_message1 instance_method1)
        (instance_message2 instance_method2)...))

‹@”\⬚FƒNƒ‰ƒXclass_name,ÌƒNƒ‰ƒXƒ⬚fbƒZ⬚[ƒW,ð'Ç‰Á,µ,½,è⬚A
        Šù,É, ,éƒNƒ‰ƒXƒ⬚fbƒZ⬚[ƒW,Ìƒ⬚ƒ\fbƒh,ð•Ï⬚X,·,é⬚B

—á⬚F(add_imethod 'stack_class '(
        (show_data (lambda()stack_pointer))
    ))

Œ‹‰Ê⬚FƒNƒ‰ƒXclass_name

date

ƒ^ƒCƒv⬚FSUBRŠÖ⬚"

⬚'Ž®⬚F(date)

‹@"\⬚FŒ»⬚Ý,Ì"ú•t,ð‹⬚,ß,é⬚BƒtƒH⬚[ƒ}ƒbƒg,Í(⬚¼—ï"N Œ˞ "ú)⬚B

—á⬚F(date) => (1997 12 25)

Œ‹‰Ê⬚F"ú•t,ðƒŠƒXƒg,É,µ,½,à,Ì

time

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(time)

‹@"\□FŒ»□Ý,ÌŽž□□,ð‹□,ß,é□BƒtƒH□[ƒ}ƒbƒg,Í(Žž •ª •b)□B

—á□F(time) => (10 34 56)

Œ‹‰Ê□FŽž□□,ðƒŠƒXƒg,É,µ,½,à,Ì

ontime

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(ontime)

‹@”\ F ¡“ú,Ì0Žž00•ª00•b,©,ç,Ìfg [ƒ^ƒ‹,ÌŽžŠÔ,ð1/100•b’PˆÊ
　　,Å‹ ,ß,½,à,Ì B—á,¦,Î AAM1:23:45.67,È,ç502567,É,È,é B

—á F(ontime) => 1234567

Œ‹‰Ê F1/100•b’PˆÊ,Å•\,µ,½Œ» Ý,ÌŽžŠÔ

gc

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(gc)

‹@"\□F‹□§"I,ÉƒK□[ƒxƒWƒRƒŒƒNƒVƒ‡ƒ",ð"□¶,³,¹,é□B

—á□F(gc) => t

Œ‹‰Ê□Ft

gcmsg

ƒ^ƒCƒv￿FSUBRŠÖ￿"

￿'Ž®￿F(gcmsg arg)   arg:t–",Ínil

‹@"\￿Ft,È,çƒK￿[ƒxƒWƒRƒŒƒNƒVƒ‡ƒ""￿¶Žž,ÉƒtŠ￿[ƒZƒ‹￿",ð•\Ž¦￿B
    nil,È,çƒK￿[ƒxƒWƒRƒŒƒNƒVƒ‡ƒ""￿¶Žž‰½,à•\Ž¦,µ,È,¢￿B

—á￿F(gcmsg t) => t

    (gc) => * GC:1234 cells * t

    (gcmsg nil) => t

    (gc) => t

Œ‹‰Ê￿Ft

promp

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(promp arg)   arg:string

‹@”\ FreadƒRƒ}ƒ“ƒhŽÀ sŽž,lƒvƒ f“ƒvƒfg,Ì•¶Žš,ðarg,É•Ï X,·,é B

—á F(promp ":Input>>") => t

Œ‹‰Ê Ft

rgb

ƒ^ƒCƒv□FSUBRŠÖ□”

□'Ž®□F(rgb R G B)　　R,G,B:number

‹@”\□FR(□Ô)□AG(—Î)□AB(□Â),ÌŽOŒ´□F,©,çƒOƒ‰ƒtƒBƒbƒNŠÖ□",ÅŽg,¤
　　□F□î•ñ,É•ÏŠ·,·,é□B,È,¨□AR,G,B,Í0□`255,Ì□®□"'I,ÅŽw'è,·
　　,é□B

—á□F(gr_line 0 0 0 100 100 (rgb 255 255 0)) => t
　　　ƒEƒCƒ"ƒh0,É(0,0),©,ç(100,100),Ü,Å‰©□F,¢□ü,ð□ø,□B

Œ‹‰Ê□F□F□î•ñ,Ì□"'I

gr_open

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(gr_open size_x size_y [type])
       size_x,size_y,type:number

‹@”\ F‰¡• size_x A csize_y,ÌƒEƒCƒ“ƒh,ðŠJ, BŒ` ó,Ítype,ÅŒˆ
     ,Ü,è A È—ª,µ,½ê‡,Ítype=7,É,È,é B

     type
       bit0:0-ƒTƒCƒY•Ï X•s‰Â”\   1-ƒTƒCƒY•Ï X‰Â”\
       bit1:0- …•½•ûŒüƒXƒNƒ [ƒ‹ƒo [–³,µ   1-—L,è
       bit2:0- ,’¼•ûŒüƒXƒNƒ [ƒ‹ƒo [–³,µ   1-—L,è
—á F(gr_open 300 200) => 0
     (gr_close 0) => t
Œ‹‰Ê FƒEƒCƒ“ƒh”Ô †

gr_close

ƒ^ƒCƒv⬚FSUBRŠÖ⬚"

⬚'Ž®⬚F(gr_close arg)   arg:number

‹@"\⬚Farg"Ô,ìƒEƒCƒ"ƒh,ð•Â,¶,é⬚B

—á⬚F(gr_open 300 200) => 0

(gr_close 0) => t

Œ‹‰Ê⬚Ft –",Í nil

gr_xy

ƒ^ƒCƒv FSUBRŠÖ”

’Ž® F(gr_xy win_no)　　win_no:number

‹@”\ Fwin_no”Ô,ÌƒEƒCƒ“ƒh,Å‰¼‘zƒEƒCƒ“ƒh,Ì,Ç,Ì À•W,ªŒ» Ý ¶ ã
,É•\Ž¦,³,ê,Ä,¢,é,©,ðŽ¦,· B À•W,Í(X À•W . Y À•W),Ì
ƒŠƒXƒg,É,µ,Ä•Ô,· BƒXƒNƒ [ƒ‹ƒo [,Ì–³,¢ƒEƒCƒ“ƒh,Å,Í
0,É,È,é B

—á F(gr_open 200 200) => 0
　　(gr_xy 0) => (12 . 34)

Œ‹‰Ê F(X À•W . Y À•W)

gr_size

ƒ^ƒCƒv｡FSUBRŠÖ｡”

｡'Ž®｡F(gr_size win_no size_x size_y)

　　　　win_no,size_x,size_y:number

‹@”\｡Fwin_no”Ô,ÌƒEƒBƒ“ƒh,ÌƒTƒCƒY,ð‰¡size_x｡A｡csize_y,É

　　,·,é｡B

—á｡F(gr_open 100 100) => 0

　　(gr_size 0 300 200) => t

Œ‹‰Ê｡Ft –”,Í nil

gr_vsize

ƒ^ƒCƒv□FSUBRŠÖ□"

□'Ž®□F(gr_vsize win_no size_x size_y)

　　　win_no,size_x,size_y:number

‹@"\□Fwin_no"Ô,ÌƒEƒBƒ"ƒh,Ì‰¼'zƒTƒCƒY,ð‰¡size_x□A□csize_y,É

　　,·,é□B‰¼'zƒTƒCƒY,ªƒEƒBƒ"ƒhƒTƒCƒY,æ,è'å,«,¢□ê□‡,Í

　　ƒXƒNƒ□□[ƒ‹ƒo□[,Å•\Ž¦^Ê'u,ð•Ï□X,Å,«,Ü,·□B

　　,È,¨□A,±,Ì–½—ß,ðŽÀ□s,·,é,Æ□AƒEƒBƒ"ƒh,ª□^,Á"',É□Á‹Ž

　　,³,ê,Ü,·□B

—á□F(gr_open 100 100) => 0

　　(gr_vsize 0 300 200) => t

Œ‹‰Ê□Ft –",Í nil

gr_line

ƒ^ƒCƒv⬚FSUBRŠÖ⬚”

⬚'Ž®⬚F(gr_line win_no x0 y0 x1 y1 color)

win_no,x0,y0,x1,y1,color:number

‹@”\⬚Fwin_no”Ô,ÌƒEƒCƒ“ƒh,Ì(x0,y0),©,ç(x1,y1),Ü,Åcolor⬚F,Å

⬚ü,ð•`,⬚B

—á⬚F(gr_open 100 100) => 0

(gr_line 0 0 20 100 80 (**rgb** 255 0 0)) => t

Œ‹‰Ê⬚Ft –”,Í nil

gr_box

ƒ^ƒCƒv：FSUBRŠÖ数

書式：F(gr_box win_no x0 y0 x1 y1 color)
　　　win_no,x0,y0,x1,y1,color:number

‹@”\：Fwin_no”Ô,ÌƒEƒCƒ“ƒh,Ì(x0,y0),Æ(x1,y1),ðŠp,Æ,·,é’·•ûŒ`
　　　,ðcolor：F,Å•`,２B

—á：F(gr_open 100 100) => 0
　　(gr_box 0 20 20 80 80 (**rgb** 255 0 0)) => t

Œ‹‰Ê：Ft –”,Í nil

gr_boxf

ƒˆƒCƒv FSUBRŠÖ ”

 ‘Ž® F(gr_boxf win_no x0 y0 x1 y1 color)
        win_no,x0,y0,x1,y1,color:number

‹@” \ Fwin_no”Ô, ÌƒEƒCƒ“ƒh, Ì(x0,y0),Æ(x1,y1),ðŠp,Æ,·,é’·•ûŒ`
       ,ðcolor F,Å•`,« A’†,ð“¯,¶ F,Å“h,è,Â,Ô,· B

—á F(gr_open 100 100) => 0
    (gr_boxf 0 20 20 80 80 (**rgb** 255 0 0)) => t

Œ‹‰Ê Ft –”,Í nil

gr_circle

ƒ^ƒCƒv〼FSUBRŠÖ〼”

〼'Ž®〼F(gr_circle win_no x0 y0 x1 y1 color [sa ea])
　　　win_no,x0,y0,x1,y1,color,sa,ea:number

‹@”\〼Fwin_no”Ô,ÌƒEƒCƒ“ƒh,Ì(x0,y0),Æ(x1,y1),ðŠp,Æ,·,é'·•ûŒ`
　　,É"à〼Ú,·,é‰~,ðcolor〼F,Å•`,〼Bsa‹y,Ñea,ð〼Ý'è,·,é,ÆŠp“x
　　sa“x,©,çea“x,Ü,Å,Ì‰~ŒÊ,ª•`,©,ê,é〼B

—á〼F(gr_open 100 100) => 0
　　(gr_circle 0 20 20 80 80 (　**rgb**　0 0 255)) => t
　　(gr_circle 0 30 30 70 70 (　**rgb**　255 0 255) -45 135) => t

Œ‹‰Ê〼Ft –”,Í nil

gr_pset

ƒ^ƒCƒv FSUBRŠÖ ”

 ‘Ž® F(gr_pset win_no x y color)
          win_no,x,y,color:number
 ‹@”\ Fwin_no”Ô,ÌƒEƒCƒ“ƒh,Ì(x,y),Écolor F,Ì“_,ð‘Å,Â B
 —á F(gr_open 100 100) => 0
     (gr_pset 0 50 50 (**rgb** 0 255 0)) => t
 Œ‹‰Ê Ft –”,Í nil

gr_symbol

ƒ^ƒCƒv￿FSUBRŠÖ￿"

￿'Ž®￿F(gr_symbol win_no x y str size_x size_y color [ang])
　　　win_no,x,y,size_x,size_y,color,ang:number
　　　str:string

‹@"\￿Fwin_no"Ô,ÌƒEƒCƒƒ"ƒh,Ì(x,y),É‰¡size_x￿A￿csize_y,Ì'å,«,³
　　,Åcolor￿F,Ì•¶Žšstr,ð•`,￿Bang,ðŽw'è,·,é,Æ"½ŽžŒvŽü,è,É
　　ang"x‰ñ"],µ,Ä•`,©,ê,é￿B

—á￿F(gr_open 100 100) => 0
　　(gr_symbol 0 50 50 "ABC" 20 10 (**rgb** 255 0 0)) => t
　　(gr_symbol 0 50 50 "ABC" 20 10 (**rgb** 0 255 0) 90) => t

Œ‹‰Ê￿Ft –",Í nil

ms_btn

ƒ^ƒCƒv FSUBRŠÖ ”

’Ž® F(ms_btn)

‹@”\ FŒ» Ýƒ}ƒEƒXƒJ [ƒ\‹,Ì, ,éƒEƒCƒ“ƒh”Ô †Aƒ{ƒ^ƒ“,Ì ó‘Ô A
À•W,Ì î•ñ,ðŽæ,è o,· BŒ‹‰Ê,ÌƒtƒH [ƒ}ƒbƒg,ÍŽŸ,Ì’Ê,è B

(ƒEƒCƒ“ƒh”Ô † (¶ƒ{ƒ^ƒ“ . ‰Eƒ{ƒ^ƒ“) (X À•W . Y À•W))
ƒ{ƒ^ƒ“,Ì ó‘Ô,Í A‰Ÿ,³,ê,Ä,¢,é ê ‡,Í'1' A‰Ÿ,³,ê,Ä,¢
,È,¯,ê,Î'0' B

—á F(ms_btn) => (1 (1 . 0) (12 . 34))

Œ» Ý Aƒ}ƒEƒX,ÍƒEƒCƒ“ƒh1,Ì ã,É—L,è A À•W(12,34),Å ¶ƒ{
ƒ^ƒ“,ª‰Ÿ,³,ê,Ä,¢,é B

Œ‹‰Ê Ft –”,Í nil

ms_left

ƒ^ƒCƒv FSUBRŠÖ ”

 ’Ž® F(ms_left)

‹@”\ Fƒ}ƒEƒX,Ì ¶ƒ{ƒ^ƒ“,ª‰Ÿ,³,ê,é,Ì,ð‘Ò,¿ A‰Ÿ,³,ê,é,ÆƒEƒCƒ“

ƒh”Ô † A À•W,ð•Ô,· BŒ‹‰Ê,ÌƒtƒH [ƒ}ƒbƒg,ÍŽŸ,Ì’Ê,è B

(ƒEƒCƒ“ƒh”Ô † (X À•W . Y À•W))

—á F(ms_left) => (5 (43 . 21))

ƒEƒCƒ“ƒh5,Ì À•W(43,21),Å ¶ƒ{ƒ^ƒ“,ª‰Ÿ,³,ê,½ B

Œ‹‰Ê Ft –”,Í nil

ms_right

ƒ^ƒCƒv FSUBRŠÖ”

 ’Ž®F(ms_right)

‹@”\ Fƒ}ƒEƒX‚Ì‰Eƒ{ƒ^ƒ“‚ª‰Ÿ‚³‚ê‚é‚Ì‚ð‘Ò‚¿ A‰Ÿ‚³‚ê‚é ÆƒEƒCƒ“
ƒh”Ô †A À•W‚ð•Ô‚· BŒ‹‰Ê ƒ}ƒEƒH [ƒ}ƒbƒg‚ÍŽ”‚Ì’l‚è B

          (ƒEƒCƒ“ƒh”Ô † (X À•W . Y À•W))

—á F(ms_right) => (5 (43 . 21))

          ƒEƒCƒ“ƒh5 Ì À•W(43,21) Å‰Eƒ{ƒ^ƒ“‚ª‰Ÿ‚³‚ê‚½ B

Œ‹‰Ê Ft –” Í nil