```
(RPAQQ COMPARECOMS
       ((FNS COMPARELST COMPARE1 COMPAREPRINT COMPAREPRINT1 COMPARELISTS COMPAREPRINTN COMPARENCHARS COMPAREFAIL
             COMPAREMAX COUNTDOWN)
        (ADDVARS (COMPARETRANSFORMS))
        (INITVARS (*COMPARE-LEVEL* 1)
               (*COMPARE-LENGTH* 2))
        (SPECVARS *COMPARE-LEVEL* *COMPARE-LENGTH* DIFFERENCES LOOSEMATCH)
        (GLOBALVARS COMPARETRANSFORMS COMMENTFLG)))

(DEFINEQ

(COMPARELST
  [LAMBDA (X Y LOOSEMATCH)                                          ; Edited 20-Jan-87 12:38 by bvm:
    (DECLARE (SPECVARS LOOSEMATCH))
    [COND
        ((EQ LOOSEMATCH -1)
         (SETQ LOOSEMATCH (COMPAREMAX X Y]
    (COMPARE1 X Y])

(COMPARE1
  [LAMBDA (X Y)                                                     ; Edited 29-Nov-2021 13:49 by rmk:
                                                                   (* lmm "29-AUG-78 18:35")

    ;; returns T if X and Y are similar;  if LOOSEMATCH then sets DIFFERENCES to changes

    (AND [OR (EQ X Y)
            (COND
              [(LISTP X)
               (COND
                 [(LISTP Y)
                  (OR (AND (EQ (CAR X)
                               COMMENTFLG)
                           (EQ (CAR Y)
                               COMMENTFLG))
                      (PROG NIL
                        LP  (RETURN (COND
                                      ((NLISTP X)
                                       (OR (EQUALALL X Y)
                                           (COMPAREFAIL X Y)))
                                      ((NLISTP Y)
                                       (COMPAREFAIL X Y))
                                      ((NOT (COMPARE1 (CAR X)
                                                      (CAR Y)))
                                       NIL)
                                      (T (SETQ X (CDR X))
                                         (SETQ Y (CDR Y))
                                         (GO LP]
                 (T (COMPAREFAIL X Y]
              (T (OR (EQUALALL X Y)
                     (COMPAREFAIL X Y]
         (OR LOOSEMATCH T)))

(COMPAREPRINT
  [LAMBDA (X Y STREAM)                                              ; Edited 20-Jan-87 12:20 by bvm:
    (PROG ((*PRINT-LEVEL* *COMPARE-LEVEL*)
           (*PRINT-LENGTH* *COMPARE-LENGTH*)
           (PLVLFILEFLG T)
          FIN)
          (COND
            ((EQUAL X Y)
             (RETURN NIL)))
          (COND
            ((OR (NLISTP X)
                 (NLISTP Y))
             (PRINT X STREAM)
             (PRINT Y STREAM)
             (GO FIN)))
          (PRIN1 '%( STREAM)                                        ; Print list X by comparison with list Y
          (COMPAREPRINT1 X Y STREAM)
          (PRIN1 '%) STREAM)
```

```
              (TERPRI STREAM)
              (PRIN1 '%( STREAM)                                      ; Do same for other list
              (COMPAREPRINT1 Y X STREAM)
              (PRIN1 '%) STREAM)
              (TERPRI STREAM)
        FIN (RETURN T])
```

(**COMPAREPRINT1**
```
  [LAMBDA (A B STREAM)                                               ; Edited 20-Jan-87 12:28 by bvm:

;;; [JDS: Added STREAM argument to direct output.]

    (PROG ((N 0)
           X Y SPACE DOTFLAG L1 TAILX TAILY K)
          (SETQ TAILX A)
          (SETQ TAILY B)
      L1  [COND
              (DOTFLAG (SETQ X TAILX)
                     (SETQ Y TAILY))
              (T (SETQ X (CAR TAILX))
                 (SETQ Y (CAR TAILY]
          [COND
             ((EQ (SETQ K (COMPAREMAX X Y))
                  (SETQ K (COMPARELST X Y K)))            ; If two sublists are the same just type '&'
              (COND
                 ((AND (NOT SPACE)
                       (LITATOM X)
                       (EQ N 0))
                  (CL:PRIN1 X STREAM)
                  (GO NX1))
                 (T (ADD1VAR N)
                    (GO NX]
          (COMPAREPRINTN N SPACE T STREAM)
          (SETQ N 0)
          (COND
             ((OR (NLISTP X)
                  (NLISTP Y)))
             [(EQ (CAR X)
                  COMMENTFLG)
              (PRIN1 **COMMENT**FLG STREAM)
              (COND
                 ((NEQ (CAR Y)
                       COMMENTFLG)
                  (SETQ TAILX (CDR TAILX))
                  (GO L1]
             ((EQ (CAR Y)
                  COMMENTFLG)
              (SPACES (NCHARS **COMMENT**FLG)
                      STREAM)
              (SETQ TAILY (CDR TAILY))
              (GO L1)))
          [COND
             ((AND (NULL K)
                   (NULL DOTFLAG))
              (COND
                 ((AND (LISTP TAILX)
                       (LISTP (CDR TAILX))
                       (COMPARELST (CADR TAILX)
                              Y -1))                        ; Next X same as this Y, so just have an inserted item
                  (CL:PRIN1 X STREAM)
                  (SETQ TAILX (CDR TAILX))
                  (GO L1))
                 ((AND (LISTP TAILY)
                       (LISTP (CDR TAILY))
                       (COMPARELST (CADR TAILY)
                              X -1))                        ; Next Y same as this X, so leave space corresponding to the
                                                            ; inserted item
                  (SPACES (COND
                             ((NLISTP Y)
                              (NCHARS Y T))
                             (T
                                (COMPARENCHARS Y)))        ; List would be printed at print level 1, so count carefully
                          STREAM)
                  (SETQ TAILY (CDR TAILY))
                  (GO L1]
          (COND
             ((OR (NLISTP X)
                  (NLISTP Y))                               ; If they are unequal and one is not a list let PRIN2 type out
                                                            ; something (atom or list)
              (CL:PRIN1 X STREAM))
             (T (PRIN1 '%( STREAM)                          ; Otherwise print '()' and subanalyze
                (COMPAREPRINT1 X Y STREAM)
                (PRIN1 '%) STREAM)))
      NX1 (SETQ SPACE T)
      NX  (COND
             ((OR DOTFLAG (NLISTP TAILX)
```

```
                    (NOT (CDR TAILX)))                                              ; X list ran out
                 (COMPAREPRINTN N SPACE NIL STREAM))
               (T (SETQ DOTFLAG (NLISTP (CDR TAILX)))
                  (COND
                     ((CDR (LISTP TAILY))
                      (SETQ TAILX (CDR TAILX))
                      (SETQ TAILY (CDR TAILY))
                      (GO L1)))
                  (COMPAREPRINTN N SPACE NIL STREAM)
                  (COND
                     (DOTFLAG (PRIN1 '" . " STREAM)
                              (CL:PRIN1 (CDR TAILX)
                                    STREAM))
                     (T                                                            ; (CDR TAILX) is a list
                        (SPACES 1 STREAM)
                        (CL:PRIN1 (CADR TAILX)
                               STREAM)
                        (AND (CDDR TAILX)
                              (PRIN1 '" --" STREAM])
```

(**COMPARELISTS**
```
  [LAMBDA (X Y STREAM)                                                             ; Edited 20-Jan-87 12:39 by bvm:

    ;; functionally equivalent to CPLISTS . Prints differences on STREAM.

    (SETQ STREAM (GETSTREAM STREAM 'OUTPUT))
    (PROG (DIFFERENCES)                                                            ; DIFFERENCES used by COMPAREFAIL
          (DECLARE (SPECVARS DIFFERENCES))
          (COND
             ((NOT (COMPARELST X Y T))                                             ; lists are different enough to require play by play display
              (COMPAREPRINT X Y STREAM))
             [DIFFERENCES                                                          ; x and y are different, but only by substitution.  Each element of
                                                                                   ; differences is a dotted pair
                      (for TAIL on DIFFERENCES do (LET ((PAIR (CAR TAIL)))
                                          (CL:FORMAT STREAM "~S -> ~S" (CAR PAIR)
                                                  (CDR PAIR))
                                     (if (CDR TAIL)
                                         then (PRIN1 ", " STREAM]
             (T (PRIN1 'SAME STREAM)))
          (TERPRI STREAM])
```

(**COMPAREPRINTN**
```
  [LAMBDA (N SPACE FLG STREAM)                                                     ; Edited  5-Nov-2021 20:53 by rmk:
                                                                                   ; Edited 29-Dec-86 11:56 by jds

    ;; RMK:  Added STREAM to POSITION and LINELENGTH

    [COND
        ((NEQ N 0)
         (COND
            (SPACE (SPACES 1 STREAM))
            (T (SETQ SPACE T)))
         (SELECTQ N
             (1 (PRIN1 '& STREAM))
             (PROGN (COND
                       ((NOT (ILESSP (IPLUS (POSITION STREAM)
                                            7)
                                    (LINELENGTH NIL STREAM)))
                        (TERPRI STREAM)))
                    (PRIN1 '- STREAM)
                    (PRIN2 N STREAM)
                    (PRIN1 '- STREAM]
       (AND FLG SPACE (SPACES 1 STREAM])
```

(**COMPARENCHARS**
```
  [LAMBDA (X)                                                                      ; Edited 20-Jan-87 12:26 by bvm:

    ;; Count the number of characters that would be printed at the current print depth

    (LET [(COMPARECNT 0)
          (*PRINT-ESCAPE* T)
          (*READTABLE* (\DTEST *READTABLE* 'READTABLEP]
         (DECLARE (SPECVARS *READTABLE* *PRINT-ESCAPE*))
         (\MAPPNAME.INTERNAL [FUNCTION (LAMBDA (S C)
                                           (ADD COMPARECNT 1]
               X)
         COMPARECNT])
```

(**COMPAREFAIL**
```
  [LAMBDA (X Y)                                                                    ; Edited 13-Jan-87 14:29 by bvm:

    ;; X and Y are different.  Return non-NIL if we are willing to believe that X and Y really are the same for purposes of not going thru
    ;; COMPAREPRINT.  DIFFERENCES is a list associating occurrences of X with a value of Y; if all such occurrences are the same, then
    ;; COMPARELST will just print a series of transformations X -> Y.

    (COND
       [[SOME COMPARETRANSFORMS (FUNCTION (LAMBDA (FN)
```

```
                                              (CL:FUNCALL FN X Y]
        ((NULL LOOSEMATCH)                                        ; exact match demanded
         NIL)
        ((NUMBERP LOOSEMATCH)
         (IGREATERP [SETQ LOOSEMATCH (COUNTDOWN Y (COUNTDOWN X (SUB1 LOOSEMATCH]
                0))
        ([AND (NLISTP X)
              (OR (NLISTP Y)
                  (EVERY Y (FUNCTION NLISTP]
         (LET ((OLD (FASSOC X DIFFERENCES)))
              (if OLD
                  then (EQUAL Y (CDR OLD))
                else (SETQ DIFFERENCES (NCONC1 DIFFERENCES (CONS X Y))))
```

(COMPAREMAX
```
   [LAMBDA (X Y)                                          (* lmm "30-AUG-78 02:19")
      (IQUOTIENT (IDIFFERENCE 65 (IPLUS (COUNTDOWN X 30)
                                        (COUNTDOWN Y 30)))
              5])
```

(COUNTDOWN
```
   [LAMBDA (X N)                                          (* lmm "30-AUG-78 02:37")
      (COND
         ((OR (NLISTP X)
              (NOT (IGREATERP N 0)))
          N)
         (T (COUNTDOWN (CDR X)
                      (COUNTDOWN (CAR X)
                                (SUB1 N]))
)
```

(ADDTOVAR **COMPARETRANSFORMS**)

(RPAQ? ***COMPARE-LEVEL*** 1)

(RPAQ? ***COMPARE-LENGTH*** 2)

(DECLARE%: DOEVAL@COMPILE DONTCOPY

(SPECVARS *COMPARE-LEVEL* *COMPARE-LENGTH* DIFFERENCES LOOSEMATCH)
)

(DECLARE%: DOEVAL@COMPILE DONTCOPY

(GLOBALVARS COMPARETRANSFORMS COMMENTFLG)
)

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