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previous date: 29-Aug-91 16:36:55 {Pele:mv:envos}<LispCore>Sources>CLTL2>CMLSEQBASICS.;1

Read Table: INTERLISP

Package: INTERLISP

Format: XCCS

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(RPAQQ **CMLSEQBASISCOMS**

```
((DECLARE%: EVAL@COMPILE DONTCOPY (FILES CMLSEQCOMMON))
 (FUNCTIONS CL:CONCATENATE CL:COPY-SEQ CL:ELT CL:LENGTH CL:MAKE-SEQUENCE CL:NREVERSE CL:REVERSE CL:SUBSEQ
  %%SETELT)
 (FUNCTIONS MAKE-SEQUENCE-OF-TYPE)
 (SETFS CL:ELT CL:SUBSEQ)
 (PROPS (CMLSEQBASICS FILETYPE))
 (DECLARE%: EVAL@COMPILE DONTCOPY DONTEVAL@LOAD (LOCALVARS . T))))
```

(DECLARE%: EVAL@COMPILE DONTCOPY

(FILESLOAD CMLSEQCOMMON)
)

```
(CL:DEFUN CL:CONCATENATE (RESULT-TYPE &REST SEQUENCES)
 [LET [(RESULT (MAKE-SEQUENCE-OF-TYPE RESULT-TYPE (LET ((CNT 0)
 (CL:DOLIST (SEQ SEQUENCES CNT)
 (SETQ CNT (+ CNT (CL:LENGTH SEQ))))))
 (SEQ-DISPATCH RESULT [LET ((TAIL RESULT)
 (CL:DOLIST (SEQUENCE SEQUENCES RESULT)
 [SEQ-DISPATCH SEQUENCE (CL:DOLIST (ELEMENT SEQUENCE)
 (RPLACA TAIL ELEMENT)
 (SETQ TAIL (CDR TAIL))))
 (CL:DOTIMES (I (VECTOR-LENGTH SEQUENCE))
 (RPLACA TAIL (CL:AREF SEQUENCE I))
 (SETQ TAIL (CDR TAIL)))]])
 (LET ((INDEX 0)
 (CL:DOLIST (SEQUENCE SEQUENCES RESULT)
 [SEQ-DISPATCH SEQUENCE (CL:DOLIST (ELEMENT SEQUENCE)
 (CL:SETF (CL:AREF RESULT INDEX)
 ELEMENT)
 (SETQ INDEX (CL:1+ INDEX))))
 (CL:DOTIMES (I (VECTOR-LENGTH SEQUENCE))
 (CL:SETF (CL:AREF RESULT INDEX)
 (CL:AREF SEQUENCE I))
 (SETQ INDEX (CL:1+ INDEX)))]])]]])
```

```
(CL:DEFUN CL:COPY-SEQ (SEQUENCE)
 "Returns a copy of SEQUENCE which is EQUALP to SEQUENCE but not EQ."
 [LET ((LENGTH (CL:LENGTH SEQUENCE))
 (SEQ-DISPATCH SEQUENCE (FORWARD-LIST-LOOP SEQUENCE 0 LENGTH (INDEX CURRENT COPY TAIL)
 COPY
 (COLLECT-ITEM CURRENT COPY TAIL))
 (LET [(COPY (MAKE-VECTOR LENGTH :ELEMENT-TYPE (CL:ARRAY-ELEMENT-TYPE SEQUENCE)
 (COPY-VECTOR-SUBSEQ SEQUENCE 0 LENGTH COPY 0 LENGTH))
```

```
(CL:DEFUN CL:ELT (SEQUENCE INDEX)
 (* amd " 5-Jun-86 17:48")
 (CL:IF (NOT (< -1 INDEX (CL:LENGTH SEQUENCE)))
 (CL:ERROR 'INDEX-BOUNDS-ERROR :NAME SEQUENCE :INDEX INDEX))
 (SEQ-DISPATCH SEQUENCE (CL:NTH INDEX SEQUENCE)
 (CL:AREF SEQUENCE INDEX)))
```

```
(CL:DEFUN CL:LENGTH (SEQUENCE)
 (SEQ-DISPATCH SEQUENCE [LET ((SIZE 0)
 (REST SEQUENCE))
 (CL:LOOP (CL:IF (NOT (CL:CONSP REST))
 (RETURN SIZE))
 (SETQ REST (CDR REST))
 (SETQ SIZE (CL:1+ SIZE)
 (VECTOR-LENGTH SEQUENCE)))
```

```
(CL:DEFUN CL:MAKE-SEQUENCE (TYPE LENGTH &KEY (INITIAL-ELEMENT NIL INITIAL-ELEMENT-P))
 "Make a sequence of the specified type"
 (CL:IF (EQ TYPE 'LIST)
 (CL:MAKE-LIST LENGTH :INITIAL-ELEMENT INITIAL-ELEMENT)
 (LET ((VECTOR (MAKE-SEQUENCE-OF-TYPE TYPE LENGTH))
 (CL:IF INITIAL-ELEMENT-P (FILL-VECTOR-SUBSEQ VECTOR 0 LENGTH INITIAL-ELEMENT))
```

VECTOR)))

```
(CL:DEFUN CL:NREVERSE (SEQUENCE)
  "Returns a sequence of the same elements in reverse order (the argument is destroyed)."
```

```
[SEQ-DISPATCH SEQUENCE [LET ((REST SEQUENCE)
  LIST-HEAD RESULT)
  (CL:LOOP (CL:IF (NOT (CL:CONSP (SETQ LIST-HEAD REST)))
    (RETURN RESULT))
    (SETQ REST (CDR REST))
    (SETQ RESULT (RPLACD LIST-HEAD RESULT]
  (LET ((LENGTH (VECTOR-LENGTH SEQUENCE)))
    (CL:DO ((LEFT-INDEX 0 (CL:1+ LEFT-INDEX))
      (RIGHT-INDEX (CL:1- LENGTH)
        (CL:1- RIGHT-INDEX))
      (HALF-LENGTH (LRSH LENGTH 1)))
      ((EQL LEFT-INDEX HALF-LENGTH)
        SEQUENCE)
      (CL:ROTATEF (CL:AREF SEQUENCE LEFT-INDEX)
        (CL:AREF SEQUENCE RIGHT-INDEX))))])
```

```
(CL:DEFUN CL:REVERSE (SEQUENCE)
  "Returns a new sequence containing the same elements but in reverse order."
```

```
[SEQ-DISPATCH SEQUENCE [LET ((REST SEQUENCE)
  RESULT)
  (CL:LOOP (CL:IF (NOT (CL:CONSP REST))
    (RETURN RESULT))
    (CL:PUSH (CAR REST)
      RESULT)
    (SETQ REST (CDR REST]
  (LET ((LENGTH (VECTOR-LENGTH SEQUENCE)))
    (CL:DO ((RESULT (MAKE-VECTOR LENGTH :ELEMENT-TYPE (CL:ARRAY-ELEMENT-TYPE SEQUENCE)))
      (FORWARD-INDEX 0 (CL:1+ FORWARD-INDEX))
      (BACKWARD-INDEX (CL:1- LENGTH)
        (CL:1- BACKWARD-INDEX)))
      ((EQL FORWARD-INDEX LENGTH)
        RESULT)
      (CL:SETF (CL:AREF RESULT FORWARD-INDEX)
        (CL:AREF SEQUENCE BACKWARD-INDEX))))])
```

```
(CL:DEFUN CL:SUBSEQ (SEQUENCE START &OPTIONAL END)
  [LET ((LENGTH (CL:LENGTH SEQUENCE))
    (CL:IF (NULL END)
      (SETQ END LENGTH))
    (CHECK-SUBSEQ SEQUENCE START END LENGTH)
    (SEQ-DISPATCH SEQUENCE (FORWARD-LIST-LOOP SEQUENCE START END (INDEX CURRENT COPY TAIL)
      COPY
      (COLLECT-ITEM CURRENT COPY TAIL))
      (LET [(COPY (MAKE-VECTOR (- END START)
        :ELEMENT-TYPE
        (CL:ARRAY-ELEMENT-TYPE SEQUENCE)
        (COPY-VECTOR-SUBSEQ SEQUENCE START END COPY 0))
```

```
(CL:DEFUN %%SETELT (SEQUENCE INDEX NEWVAL)
  (CL:IF (NOT (< -1 INDEX (CL:LENGTH SEQUENCE)))
    (CL:ERROR 'INDEX-BOUNDS-ERROR :NAME SEQUENCE :INDEX INDEX))
  (SEQ-DISPATCH SEQUENCE (CL:SETF (CL:NTH INDEX SEQUENCE)
    NEWVAL)
    (CL:SETF (CL:AREF SEQUENCE INDEX)
      NEWVAL)))
```

```
(CL:DEFUN MAKE-SEQUENCE-OF-TYPE (TYPE LENGTH)
  [LET ((BROAD-TYPE (TYPE-SPECIFIER TYPE))
    TYPE-LENGTH)
  (CL:IF (EQ BROAD-TYPE 'LIST)
    (CL:MAKE-LIST LENGTH)
    [LET [(ELEMENT-TYPE (CASE BROAD-TYPE
      ((CL:SIMPLE-STRING STRING)
        (SETQ TYPE-LENGTH (AND (CL:CONSP TYPE)
          (CL:SECOND TYPE)))
        'CL:STRING-CHAR)
      ((CL:SIMPLE-BIT-VECTOR CL:BIT-VECTOR)
        (SETQ TYPE-LENGTH (AND (CL:CONSP TYPE)
          (CL:SECOND TYPE)))
        'BIT)
      (CL:SIMPLE-VECTOR
        (SETQ TYPE-LENGTH (AND (CL:CONSP TYPE)
          (CL:SECOND TYPE)))
        T)
      ((CL:ARRAY CL:VECTOR CL:SIMPLE-ARRAY)
        (CL:IF (CL:CONSP TYPE)
          (LET ((ELT-TYPE (CADR TYPE)))
            (SETQ TYPE-LENGTH (CL:THIRD TYPE))
```

```

          (CL:IF (CL:CONSP TYPE-LENGTH)
                (SETQ TYPE-LENGTH (CAR TYPE-LENGTH)))
          (CL:IF [AND ELT-TYPE (NOT (EQ ELT-TYPE 'CL:*)
                                ELT-TYPE
                                T))
                T)))]
(CL:IF (AND (CL:INTEGERP TYPE-LENGTH)
           (NOT (EQUAL TYPE-LENGTH LENGTH)))
      (CL:ERROR "~D is not the length of type ~s" LENGTH TYPE))
(CL:IF ELEMENT-TYPE
      (MAKE-VECTOR LENGTH :ELEMENT-TYPE ELEMENT-TYPE)
      (LET ((EXPANDER (CL::TYPE-EXPANDER BROAD-TYPE)))
          (CL:IF EXPANDER
                (MAKE-SEQUENCE-OF-TYPE (CL::TYPE-EXPAND TYPE EXPANDER)
                                       LENGTH)
                (CL:ERROR "~S is a bad type specifier for sequences." TYPE)))))]))

```

```
(CL:DEFSETF CL:ELT %%SETELT)
```

```
(CL:DEFSETF CL:SUBSEQ (SEQUENCE START &OPTIONAL END) (NEW-SEQUENCE)
  `(PROGN (CL:REPLACE ,SEQUENCE ,NEW-SEQUENCE :START1 ,START :END1 ,END)
          ,NEW-SEQUENCE))
```

```
(PUTPROPS CMLSEQBASICS FILETYPE CL:COMPILE-FILE)
```

```
(DECLARE%: EVAL@COMPILE DONTCOPY DONTEVAL@LOAD
```

```
(DECLARE%: DOEVAL@COMPILE DONTCOPY
```

```
(LOCALVARS . T)
)
)
```

```
(PUTPROPS CMLSEQBASICS COPYRIGHT ("Venue & Xerox Corporation" 1986 1987 1990 1991 1993))
```

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CL:COPY-SEQ .....1 CL:MAKE-SEQUENCE .....1 CL:REVERSE .....2

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