

File created: 5-Dec-2023 12:07:41 {CLOS}NEW-CLOS-BROWSER.;3

edit by: mth

changes to: (IL:PROPS (IL:NEW-CLOS-BROWSER IL:MAKEFILE-ENVIRONMENT))

previous date: 5-Dec-2023 00:58:05 {CLOS}NEW-CLOS-BROWSER.;2

Read Table: XCL

Package: USER

Format: XCCS

; Copyright (c) 1991, 2020, 2023 by Venue.

(IL:RPAQQ IL:NEW-CLOS-BROWSECOMS

(

... \*\*\*\*\*

;;

;;

;;

;;; Print out a copyright notice when loading

;;

(IL:P (FORMAT T "~&;CLOS-BROWSER Copyright (c) 1991 VENUE Corporation. All rights reserved.~%"))

;;; LOAD DEPENDENT MODULES

;; Note: before compiling clos-browser:

;; (load 'web-editor.dfasl)

;; (load 'clos-browser.dfasl)

;; (load 'clos-browser 'prop)

;;

;;; PACKAGE STUFF

(IL:PROPS (IL:NEW-CLOS-BROWSER IL:MAKEFILE-ENVIRONMENT)

(IL:NEW-CLOS-BROWSER IL:FILETYPE))

;; (IL:P IL:\* USER::CLOS-BROWSER-PACKAGE-COMMANDS)

;;

;;; SYSTEM PATCHES

;;

;;

;;

;;; CLOS-ICON CLASS & INSTANCE INITIALIZATION

(CLOS::CLASSES CLOS-BROWSER:CLOS-ICON)

(IL:VARIABLES CLOS-BROWSER:CLOS-ICON)

;;

;;; CLOS-BROWSER CLASS

(IL:FUNCTIONS CLOS-BROWSER:BROWSE-CLASS CLOS-BROWSER::COLLECT-FAMILY CLOS-BROWSER::MAKE-NODES

CLOS-BROWSER::CLOS-BROWSER-CLOSE-FN CLOS-BROWSER::BROWSER-CONTAINS-P)

(CLOS::CLASSES CLOS-BROWSER:CLOS-BROWSER)

(CLOS::METHODS (CLOS-BROWSER::ADD-ROOT (CLOS-BROWSER:CLOS-BROWSER))

(CLOS-BROWSER::ADD-ROOTS (CLOS-BROWSER:CLOS-BROWSER))

(WEB:BOX-NODE (CLOS-BROWSER:CLOS-BROWSER))

(WEB:BROWSE (CLOS-BROWSER:CLOS-BROWSER))

(CLOS-BROWSER::CLEAR-METHOD-MENU-CACHES (CLOS-BROWSER:CLOS-BROWSER))

(WEB:ICON-TITLE (CLOS-BROWSER:CLOS-BROWSER))

(WEB:INITIALIZE-EDITOR (CLOS-BROWSER:CLOS-BROWSER))

(CLOS-BROWSER::NEW-ITEM (CLOS-BROWSER:CLOS-BROWSER))

(WEB:RECOMPUTE (CLOS-BROWSER:CLOS-BROWSER))

(CLOS-BROWSER::REAL-ADD-ROOT (CLOS-BROWSER:CLOS-BROWSER))

(WEB:SHAPE-TO-HOLD (CLOS-BROWSER:CLOS-BROWSER))

; multi-method

```

(CLOS-BROWSER::SUBCLASSES-OF NIL)
(CLOS-BROWSER::CONTAINS-P (T CLOS-BROWSER:CLOS-BROWSER))
;;

```

;;; CLOS-BROWSER-NODE CLASS

```

(CLOS::CLASSES CLOS-BROWSER::CLOS-BROWSER-NODE)
(CLOS::METHODS (CLOS-BROWSER::OBJECT-NAME (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::OVERRIDE (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::CACHE (T CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::UNCACHE (CLOS-BROWSER::CLOS-BROWSER-NODE)))
(IL:VARS (CLOS-BROWSER::*METHOD-PROMPT-STRING* (CONCATENATE 'STRING "Left button to edit the
method." "\
"Middle button provides a menu of operations."))
)
(IL:FUNCTIONS CLOS-BROWSER::EDIT CLOS-BROWSER::MAKE-METHOD-MENU-ITEMS
CLOS-BROWSER::MAKE-TOP-LEVEL-METHOD-MENU-ITEMS CLOS-BROWSER::MAKE-MULTI-METHOD-SUB-MENU)
;;

```

;; OPERATORS (via CLOS-BROWSER-NODE) ON CLOS::STANDARD-CLASS

```

(CLOS::METHODS (CLOS-BROWSER:ADD-BROWSER-METHOD (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::BROWSE-SUBS (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::EDIT-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::INSPECT-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::MENU-METHODS (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::MAKE-WHENSELECTEDFN (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::DESCRIBE-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::DOCUMENTATION-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::PRINT-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE))
 (CLOS-BROWSER::SPECIALIZE-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE)))
(IL:FUNCTIONS CLOS-BROWSER::COMPLETE-ADD-METHOD CLOS-BROWSER::COMPLETE-SPECIALIZE
CLOS-BROWSER::LYRIC-COMPLETE-SPECIALIZE CLOS-BROWSER::THIS-CLASS-NODE-P
CLOS::CLASS-DIRECT-METHODS)
;;

```

;; OPERATORS ON CLOS::STANDARD-CLASS (directly)

```

(CLOS::METHODS (CLOS::COMPUTE-INHERITED-METHODS (STANDARD-CLASS))
 (CLOS-BROWSER::SPECIALIZE (STANDARD-CLASS))
 (CLOS-BROWSER::SUBCLASSES-OF (STANDARD-CLASS)))
;;

```

;; OPERATORS ON CLOS::STANDARD-METHOD

```

(CLOS::METHODS (CLOS-BROWSER::DELETE-METHOD (STANDARD-METHOD))
 (CLOS-BROWSER::COPY (STANDARD-METHOD STANDARD-CLASS))
 (WEB:MOVE (STANDARD-METHOD STANDARD-CLASS))
 (CLOS-BROWSER::PRINT-DEFINITION (STANDARD-METHOD))
 (CLOS-BROWSER::DESCRIBE-METHOD (CLOS::METHOD))
 (CLOS-BROWSER::RENAME (STANDARD-METHOD))
 (CLOS-BROWSER::UPDATE-CACHED-MENUES (STANDARD-METHOD))
 (CLOS-BROWSER::WHO-OWNS (STANDARD-METHOD))
)
;; update-cached-menues must appear before add-method :after in the coms
(ADD-METHOD :AFTER (STANDARD-GENERIC-FUNCTION STANDARD-METHOD))
(IL:FUNCTIONS CLOS-BROWSER::REPLACE-SPECIALIZERS)
;;

```

;;; SETUP RELEASE INFO

```

(IL:VARS (CLOS-BROWSER::RELEASE-ID "0.02")
 (CLOS-BROWSER::SYSTEM-DATE (CAAR (IL:GETPROP 'IL:CLOS-BROWSER 'IL:FILEDATES))))
;;

```

;;; SETUP BACKGROUND MENU

```

(IL:FUNCTIONS CLOS-BROWSER::IN-SELECT-PACKAGE CLOS-BROWSER::CLASSES-IN-PACKAGE)
(IL:P ;; pushnew should eliminate this
 (SETQ IL:|BackgroundMenuCommands| (REMOVE 'IL:|BrowseClass| IL:|BackgroundMenuCommands| :KEY
#'CAR))
 (PUSH ' (IL:|BrowseClass| (CLOS-BROWSER:BROWSE-CLASS)
"Bring up a class browser."
(IL:SUBITEMS (IL:|all in a package| (CLOS-BROWSER:BROWSE-CLASS (
CLOS-BROWSER::CLASSES-IN-PACKAGE
(CLOS-BROWSER::IN-SELECT-PACKAGE
))))
"Select a package and browse all the classes defined in that
package.")))
IL:|BackgroundMenuCommands|)
(SETQ IL:|BackgroundMenu| NIL)))

```

... \*\*\*\*\*  
;;

;;  
;; Print out a copyright notice when loading  
;;

(FORMAT T "~&;CLOS-BROWSER Copyright (c) 1991 VENUE Corporation. All rights reserved.~%")

;; LOAD DEPENDENT MODULES  
;; Note: before compiling clos-browser:

;; (load 'web-editor.dfasl)  
;; (load 'clos-browser.dfasl)  
;; (load 'clos-browser 'prop)  
;;

;; PACKAGE STUFF

(IL:PUTPROPS **IL:NEW-CLOS-BROWSER IL:MAKEFILE-ENVIRONMENT** (:PACKAGE (PROGN (XCL:DEFPACKAGE "CLOS-BROWSER"  
(:USE "CLOS")  
(:EXPORT "CLOS-ICON"  
"CLOS-BROWSER"  
"ADD-BROWSER-METHOD"  
"BROWSE-CLASS"))  
(FIND-PACKAGE "USER"))  
:READTABLE "XCL" :BASE 10))

(IL:PUTPROPS **IL:NEW-CLOS-BROWSER IL:FILETYPE** :COMPILE-FILE)

;; (IL:P IL:\* USER::CLOS-BROWSER-PACKAGE-COMMANDS)

;;  
;; SYSTEM PATCHES  
;;

;;  
;;  
;;

;; CLOS-ICON CLASS & INSTANCE INITIALIZATION

(DEFCLASS CLOS-BROWSER:CLOS-ICON (STANDARD-OBJECT)  
(CLOS-BROWSER::CLASS-BROWSERS :ALLOCATION :CLASS :INITFORM NIL)  
; list of all open browsers  
(CLOS-BROWSER::DESTINATION-BROWSER :ALLOCATION :CLASS :INITFORM NIL)  
; browser containing boxed node  
(CLOS-BROWSER::MENU-CACHE-SWITCH :ALLOCATION :CLASS :INITFORM :LAZY  
;; valid values:  
;; :none for never use cache  
;; :lazy for invalidate cache at method create or remove time causing re-compute and cache at menu request time.  
;; :eager (not implemented) for re-compute and cache menu whenever a method is created or removed  
)))

(XCL:DEFGLOBALPARAMETER **CLOS-BROWSER:CLOS-ICON** (MAKE-INSTANCE 'CLOS-BROWSER:CLOS-ICON))

;;  
;; CLOS-BROWSER CLASS

(DEFUN **CLOS-BROWSER:BROWSE-CLASS** (&OPTIONAL CLOS-BROWSER::CLASS-NAME-OR-LIST &KEY (  
CLOS-BROWSER::DIRECTION  
:SUB)  
(CLOS-BROWSER::WINDOW-OR-TITLE "CLOS-browser")  
CLOS-BROWSER::GOOD-CLASSES POSITION)  
(LET\* ((CLOS-BROWSER::ROOT-CLASSES (WHEN CLOS-BROWSER::CLASS-NAME-OR-LIST  
(IF (LISTP CLOS-BROWSER::CLASS-NAME-OR-LIST)  
(MAPCAR #'FIND-CLASS CLOS-BROWSER::CLASS-NAME-OR-LIST)  
(CONS (FIND-CLASS CLOS-BROWSER::CLASS-NAME-OR-LIST))))))  
(CLOS-BROWSER::NODES (**CLOS-BROWSER::MAKE-NODES (CLOS-BROWSER::COLLECT-FAMILY** NIL  
CLOS-BROWSER::ROOT-CLASSES)))  
(CLOS-BROWSER:CLOS-BROWSER (MAKE-INSTANCE 'CLOS-BROWSER:CLOS-BROWSER)))  
(WEB:INITIALIZE-EDITOR CLOS-BROWSER:CLOS-BROWSER)  
(SETF (SLOT-VALUE CLOS-BROWSER:CLOS-BROWSER 'CLOS-BROWSER::ROOT-CLASSES)  
CLOS-BROWSER::ROOT-CLASSES)



```

                                objects")
                                ("Recompute labels"
                                WEB:RECOMPUTE-LABELS
                                "Recomputes the
                                labels")
                                ("Recompute in place"
                                WEB:RECOMPUTE-IN-PLACE
                                "Recompute keeping
                                current view in
                                window")
                                ("Clear caches"
                                CLOS-BROWSER::CLEAR-METHOD-MENU-CACHES
                                "Clear cached
                                menus of
                                methods.")))
("Browser looks" NIL "" (IL:SUBITEMS ("Shape to hold" WEB:SHAPE-TO-HOLD "Make window large or
                                small enough to just hold graph")
                                ("Change font size" WEB:CHANGE-FONT-SIZE "Choose a new size Font")
                                ("Change format" WEB:CHANGE-FORMAT "Change format between lattice
                                and tree")))
("Add root " CLOS-BROWSER::ADD-ROOT "Add named item to startingList for browser."
(IL:SUBITEMS ("all in a package" CLOS-BROWSER::ADD-ROOTS "Add all the classes in a package
to this browser.")))
;; ("Unhide class" remove-from-bad-list "Restore item previously deleted from browser")
)
(WEB:LEFT-BUTTON-ITEMS :ALLOCATION :CLASS
;; Menu items for LeftButton selection -- Value sent as message to object or browser -- see local-commands
:INITFORM
'WEB:BOX-NODE)
(WEB:MIDDLE-BUTTON-ITEMS :ALLOCATION :INSTANCE
;; Menu items for MiddleButton selection -- Value sent as message to object or browser -- see local-commands
:INITFORM
'(("Edit" CLOS-BROWSER::EDIT-CLASS "Edit the class." (IL:SUBITEMS ("Edit" CLOS-BROWSER::EDIT-CLASS
                                "Edit the class.")
                                ("Inspect" CLOS-BROWSER::INSPECT-CLASS
                                "Bring up an inspector on the
                                class.")))
("Add method" CLOS-BROWSER::ADD-BROWSER-METHOD "Add a method to the class.")
("Browse" CLOS-BROWSER::BROWSE-SUBS "Bring up a browser on this class."
(WHEN NIL ;superclasses not implemented
(IL:SUBITEMS ("sub classes" CLOS-BROWSER::BROWSE-SUBS "Bring up a browser on this
class."
("super classes" CLOS-BROWSER::BROWSE-SUPERS "Not Implemented"))))
("Print" CLOS-BROWSER::PRINT-CLASS "Print the form defining the class." (IL:SUBITEMS ("Print"
                                CLOS-BROWSER::PRINT-CLASS
                                "Print the
                                form
                                defining the
                                class.")
                                ("Describe"
                                CLOS-BROWSER::DESCRIBE-CLASS
                                "Print a
                                description
                                of the
                                class.")
                                ("Documentation"
                                CLOS-BROWSER::DOCUMENTATION-CLASS
                                "Display the
                                documentation for
                                the class.")))
("Specialize" CLOS-BROWSER::SPECIALIZE-CLASS "Create a new sub-class of this class.")
("-----" CLOS-BROWSER::EDIT-CLASS "Above this line operates on the class.
Below this line operates
on individual slots and methods.")
("slots" CLOS-BROWSER::EDIT-CLASS "Edit the defclass definition.")
("methods" (CLOS-BROWSER::MENU-METHODS
"Build a menu of methods local to this class."
(IL:SUBITEMS ("local" (CLOS-BROWSER::MENU-METHODS
"Show a menu of methods specialized on this class.."
(IL:SUBITEMS ("Use cached menu" (CLOS-BROWSER::MENU-METHODS
"Do not recompute the menu of methods")
("Recompute menu" (CLOS-BROWSER::MENU-METHODS NIL NIL NIL T)
"Recompute the menu of methods")))
("inherited" (CLOS-BROWSER::MENU-METHODS :INHERITED)
"Show only methods inherited by this class."
(IL:SUBITEMS ("Use cached menu" (CLOS-BROWSER::MENU-METHODS :INHERITED)
"Do not recompute the menu of methods")
("Recompute menu" (CLOS-BROWSER::MENU-METHODS :INHERITED NIL NIL T)
"Recompute the menu of methods")))
("all" (CLOS-BROWSER::MENU-METHODS :ALL)
"Show all methods understood by this class."

```

```

      (IL:SUBITEMS ("Use cached menu" (CLOS-BROWSER::MENU-METHODS :ALL)
                  "Do not recompute the menu of methods")
                  ("Recompute menu" (CLOS-BROWSER::MENU-METHODS :ALL NIL NIL T)
                  "Recompute the menu of methods"))))
(CLOS-BROWSER::TITLE :INITFORM "CLOS Browser" ; Title passed to GRAPHER package
  )))

```

```

(DEFMETHOD CLOS-BROWSER::ADD-ROOT ((CLOS-BROWSER::BROWSER CLOS-BROWSER:CLOS-BROWSER)
  &OPTIONAL
  (CLOS-BROWSER::NEW-ITEM (CLOS-BROWSER::NEW-ITEM CLOS-BROWSER::BROWSER
  )))
"Add a named item to the starting list of the browser "
(IF (CLOS-BROWSER::REAL-ADD-ROOT CLOS-BROWSER::BROWSER CLOS-BROWSER::NEW-ITEM)
  (WEB:RECOMPUTE CLOS-BROWSER::BROWSER)
  ;; otherwise warn the user
  (WEB:PROMPT-PRINT CLOS-BROWSER::BROWSER (FORMAT NIL "~A not added to browser." CLOS-BROWSER::NEW-ITEM)))

```

```

(DEFMETHOD CLOS-BROWSER::ADD-ROOTS ((CLOS-BROWSER::BROWSER CLOS-BROWSER:CLOS-BROWSER)
  &OPTIONAL
  (CLOS-BROWSER::NEW-ITEMS (CLOS-BROWSER::CLASSES-IN-PACKAGE (
  CLOS-BROWSER::IN-SELECT-PACKAGE
  ))))
"Add all classes in a package to the starting list of the browser"
(DOLIST (CLOS-BROWSER::CLASS CLOS-BROWSER::NEW-ITEMS)
  (UNLESS (CLOS-BROWSER::REAL-ADD-ROOT CLOS-BROWSER::BROWSER CLOS-BROWSER::CLASS)
    (WEB:PROMPT-PRINT CLOS-BROWSER::BROWSER (FORMAT NIL "~A not added to browser." CLOS-BROWSER::CLASS)))
  )
(WEB:RECOMPUTE CLOS-BROWSER::BROWSER))

```

```

(DEFMETHOD WEB:BOX-NODE ((CLOS-BROWSER::BROWSER CLOS-BROWSER:CLOS-BROWSER)
  CLOS-BROWSER::OBJECT &OPTIONAL CLOS-BROWSER::KEEP-PREVIOUS-BOX)
  (CALL-NEXT-METHOD)
  (SETF (SLOT-VALUE CLOS-BROWSER:CLOS-ICON 'CLOS-BROWSER::DESTINATION-BROWSER)
    CLOS-BROWSER::BROWSER))

```

```

(DEFMETHOD WEB:BROWSE ((CLOS-BROWSER::SELF CLOS-BROWSER:CLOS-BROWSER)
  &OPTIONAL CLOS-BROWSER::BROWSE-LIST CLOS-BROWSER::WINDOW-OR-TITLE
  CLOS-BROWSER::GOOD-LIST POSITION)
  (LET ((CLOS-BROWSER::BROWSER (CALL-NEXT-METHOD)))
    (PUSHNEW CLOS-BROWSER::BROWSER (SLOT-VALUE CLOS-BROWSER:CLOS-ICON 'CLOS-BROWSER::CLASS-BROWSERS))))

```

```

(DEFMETHOD CLOS-BROWSER::CLEAR-METHOD-MENU-CACHES ((CLOS-BROWSER::SELF CLOS-BROWSER:CLOS-BROWSER)
  (DOLIST (CLOS-BROWSER::NODE (SLOT-VALUE CLOS-BROWSER::SELF 'WEB::STARTING-LIST
  ; starting-list is really all the nodes in the browser.
  )))
  (SETF (SLOT-VALUE CLOS-BROWSER::NODE WEB::MENU-CACHE)
    NIL)))

```

```

(DEFMETHOD WEB:ICON-TITLE ((CLOS-BROWSER::SELF CLOS-BROWSER:CLOS-BROWSER)
  (WEB:NODE-NAME (CAR (LAST (SLOT-VALUE CLOS-BROWSER::SELF 'WEB::STARTING-LIST)))))

```

```

(DEFMETHOD WEB:INITIALIZE-EDITOR ((CLOS-BROWSER::BROWSER CLOS-BROWSER:CLOS-BROWSER)
  "initialize and setup closefn"
  (CALL-NEXT-METHOD)
  (PUSHNEW CLOS-BROWSER::BROWSER (SLOT-VALUE CLOS-BROWSER:CLOS-ICON 'CLOS-BROWSER::CLASS-BROWSERS))
  (LET ((CLOS-BROWSER::WINDOW (SLOT-VALUE CLOS-BROWSER::BROWSER 'WEB::WINDOW)))
    (IL:WINDOWADDPROP CLOS-BROWSER::WINDOW 'IL:CLOSEFN 'CLOS-BROWSER::CLOS-BROWSER-CLOSE-FN T))
  CLOS-BROWSER::BROWSER)

```

```

(DEFMETHOD CLOS-BROWSER::NEW-ITEM ((CLOS-BROWSER::SELF CLOS-BROWSER:CLOS-BROWSER)
  &OPTIONAL CLOS-BROWSER::NEW-ITEM)
  (UNLESS CLOS-BROWSER::NEW-ITEM
    (SETQ CLOS-BROWSER::NEW-ITEM (WEB:PROMPT-READ CLOS-BROWSER::SELF "Class")))

```

```

(DEFMETHOD WEB:RECOMPUTE ((CLOS-BROWSER::SELF CLOS-BROWSER:CLOS-BROWSER)
  &OPTIONAL CLOS-BROWSER::DONT-RESHAPE-FLG)
  ;; this should be moved to a more intelligent recompute-nodes function that does not have to re-build every single node.
  (SETF (SLOT-VALUE CLOS-BROWSER::SELF 'WEB::STARTING-LIST)
    (CLOS-BROWSER::MAKE-NODES (CLOS-BROWSER::COLLECT-FAMILY NIL (IL:FOR CLOS-BROWSER::EACH
  IL:IN (REVERSE
  ; so they come out in the original order
  (SLOT-VALUE
  CLOS-BROWSER::SELF
  /
  WEB::STARTING-LIST

```

```

))
IL:WHEN CLOS-BROWSER::EACH
IL:COLLECT (SLOT-VALUE
              CLOS-BROWSER::EACH
              ,
              CLOS-BROWSER::CLASS
              )))

(CALL-NEXT-METHOD)
(WHEN (SLOT-VALUE CLOS-BROWSER:CLOS-ICON 'CLOS-BROWSER::DESTINATION-BROWSER)
  ;; Node has been invalidated, so get rid of this pointer to it.
  (SETF (SLOT-VALUE (SLOT-VALUE CLOS-BROWSER:CLOS-ICON 'CLOS-BROWSER::DESTINATION-BROWSER)
                   'WEB:BOXED-NODE)
        NIL)
  (SETF (SLOT-VALUE CLOS-BROWSER:CLOS-ICON 'CLOS-BROWSER::DESTINATION-BROWSER)
        NIL)))

(DEFMETHOD CLOS-BROWSER::REAL-ADD-ROOT ((CLOS-BROWSER::BROWSER CLOS-BROWSER:CLOS-BROWSER)
                                         CLOS-BROWSER::CLASS)
  "Add a class to the starting list of the browser"
  (WHEN CLOS-BROWSER::CLASS
    (LET* ((CLOS-BROWSER::CLASS (IF (TYPEP CLOS-BROWSER::CLASS 'STANDARD-CLASS)
                                     CLOS-BROWSER::CLASS
                                     (FIND-CLASS CLOS-BROWSER::CLASS)))
           (CLOS-BROWSER::NEW-NODE (CAR (CLOS-BROWSER::MAKE-NODES (LIST CLOS-BROWSER::CLASS))))
           (IF CLOS-BROWSER::NEW-NODE
               (PROGN (PUSHNEW CLOS-BROWSER::NEW-NODE (SLOT-VALUE CLOS-BROWSER::BROWSER 'WEB::STARTING-LIST))
                      (IF (SLOT-VALUE CLOS-BROWSER::BROWSER 'WEB::GOOD-LIST)
                          (PUSHNEW CLOS-BROWSER::NEW-NODE (SLOT-VALUE CLOS-BROWSER::BROWSER 'WEB::GOOD-LIST))
                          (SETF (SLOT-VALUE CLOS-BROWSER::BROWSER 'WEB::BAD-LIST)
                                (IL:DREMOVE CLOS-BROWSER::NEW-NODE (SLOT-VALUE CLOS-BROWSER::BROWSER
                                                                    'WEB::BAD-LIST))))
                          CLOS-BROWSER::BROWSER)
                      ;; otherwise return nil
                      NIL))))
          (DEFMETHOD WEB:SHAPE-TO-HOLD ((WEB::SELF CLOS-BROWSER:CLOS-BROWSER))
            "give a larger width for empty browsers so add-node will have room"
            (LET* ((WEB::WINDOW (SLOT-VALUE WEB::SELF 'WEB::WINDOW))
                   (WEB::NODES (IL:|fetch| IL:GRAPHNODES IL:|of| (IL:WINDOWPROP WEB::WINDOW 'IL:GRAPH))))
              (IF WEB::NODES
                  (CALL-NEXT-METHOD)
                  (LET ((WEB::REGION (IL:WINDOWPROP WEB::WINDOW 'IL:REGION))
                        (WEB::MIN-HEIGHT (IL:FONTHEIGHT (IL:DSPFONT NIL WEB::WINDOW)))
                        (WEB::MIN-WIDTH (MAX 250 (IL:IPLUS 5 (IL:STRINGWIDTH (SLOT-VALUE WEB::SELF 'WEB::TITLE)
                                                                              (IL:DSPFONT NIL IL:|WindowTitleDisplayStream|))))
                        ))
                    (WEB::SET-REGION WEB::SELF (IL:CREATEREGION (IL:|fetch| IL:LEFT IL:|of| WEB::REGION)
                                                                (IL:|fetch| IL:BOTTOM IL:|of| WEB::REGION)
                                                                WEB::MIN-WIDTH WEB::MIN-HEIGHT))))))

(DEFMETHOD CLOS-BROWSER::SUBCLASSES-OF ((CLOS-BROWSER::CLASS T))
  (APPEND (LIST CLOS-BROWSER::CLASS)
    (IL:FOR CLOS-BROWSER::SUBCLASS IL:IN (SLOT-VALUE CLOS-BROWSER::CLASS 'CLOS::DIRECT-SUBCLASSES)
      IL:JOIN (IF (SLOT-VALUE CLOS-BROWSER::SUBCLASS 'CLOS::DIRECT-SUBCLASSES)
                  (CLOS-BROWSER::SUBCLASSES-OF CLOS-BROWSER::SUBCLASS)
                  (LIST CLOS-BROWSER::SUBCLASS))))))

(DEFMETHOD CLOS-BROWSER::CONTAINS-P ((CLOS-BROWSER::CLASS T)
                                       (CLOS-BROWSER::BROWSER CLOS-BROWSER:CLOS-BROWSER))
  (LET ((CLOS-BROWSER::NODE (CAR (MEMBER CLOS-BROWSER::CLASS (SLOT-VALUE CLOS-BROWSER::BROWSER
                                                                    'WEB::STARTING-LIST)
                                                                    :TEST
                                                                    #'CLOS-BROWSER::THIS-CLASS-NODE-P))))
    (WHEN (AND CLOS-BROWSER::NODE (NOT (MEMBER CLOS-BROWSER::CLASS (SLOT-VALUE CLOS-BROWSER::BROWSER
                                                                              'WEB::BAD-LIST)
                                                                              :TEST
                                                                              #'CLOS-BROWSER::THIS-CLASS-NODE-P)))
      CLOS-BROWSER::NODE)))

;;
;;; CLOS-BROWSER-NODE CLASS

(DEFCLASS CLOS-BROWSER::CLOS-BROWSER-NODE (WEB:WEB-NODE)
  ((CLOS-BROWSER::CLASS
    )
   (CLOS-BROWSER::MENU-CACHE :INITFORM NIL)
   (CLOS-BROWSER::LARGE-MENU-SIZE :ALLOCATION :CLASS :INITFORM 22)
  )
  ; The class represented by this node
  ; Menus of methods and slots. See clos-icon for the switch that
  ; controls when this gets updated.

```

```
(CLOS-BROWSER::LARGE-MENU-FONT :ALLOCATION :INSTANCE :INITFORM (IL:FONTCREATE '(IL:HELVETICA 8)))
(CLOS-BROWSER::LOCAL-METHOD-OPERATIONS :ALLOCATION :INSTANCE :INITFORM
 ' ("Edit" 'CLOS-BROWSER::EDIT "Bring up the editor on this method's definition."
  (IL:SUBITEMS ("Inspect" 'INSPECT "Inspect this method")))
 ("Print" 'CLOS-BROWSER::PRINT-DEFINITION "Pretty Print this method's definition."
  (IL:SUBITEMS ("Print" 'PRINT "Print this method's definition."
    ("Describe" 'CLOS-BROWSER::DESCRIBE-METHOD "Describe this method."
     ("Documentation" 'DOCUMENTATION "Print this method's documentation."))))
 ("Delete" 'CLOS-BROWSER::DELETE-METHOD "Remove this method.")
 ("Copy" 'CLOS-BROWSER::COPY "Copy this method to boxed class.")
 ("Move" 'WEB:MOVE "Move this method to boxed class.")
 ("Rename" 'CLOS-BROWSER::RENAME "Change the name of this method to new name you specify")
 ("Break" 'CLOS::BREAK-METHOD "Cause a break window whenever this method is invoked.")
 ("Trace" 'CLOS::TRACE-METHOD "Trace this method.")
 ("UnBreak" 'CLOS::UNBREAK-METHOD "Unbreak this method.")
 ("Who owns" 'CLOS-BROWSER::WHO-OWNS "Show the classes on which this method is specialized.")))
(CLOS-BROWSER::INHERITED-METHOD-OPERATIONS :ALLOCATION :INSTANCE :INITFORM
 ' ("Edit" 'CLOS-BROWSER::EDIT "Bring up the editor on this method's definition."
  (IL:SUBITEMS ("Inspect" 'INSPECT "Inspect this method")))
 ("Print" 'CLOS-BROWSER::PRINT-DEFINITION "Pretty Print this method's definition."
  (IL:SUBITEMS ("Print" 'PRINT "Print this method's definition."
    ("Describe" 'CLOS-BROWSER::DESCRIBE-METHOD "Describe this method."
     ("Documentation" 'DOCUMENTATION "Print this method's documentation."))))
 ("Override" 'CLOS-BROWSER::OVERRIDE "Create a local method with this name.")
 ("Break" 'CLOS::BREAK-METHOD "Cause a break window whenever this method is invoked.")
 ("Trace" 'CLOS::TRACE-METHOD "Trace this method.")
 ("UnBreak" 'CLOS::UNBREAK-METHOD "Unbreak this method.")
 ("Who owns" 'CLOS-BROWSER::WHO-OWNS "Show the classes on which this method is specialized.")))
(CLOS-BROWSER::ALL-METHOD-OPERATIONS :ALLOCATION :INSTANCE :INITFORM
 ' ("Edit" 'CLOS-BROWSER::EDIT "Bring up the editor on this method's definition."
  (IL:SUBITEMS ("Inspect" 'INSPECT "Inspect this method")))
 ("Print" 'CLOS-BROWSER::PRINT-DEFINITION "Pretty Print this method's definition."
  (IL:SUBITEMS ("Print" 'PRINT "Print this method's definition."
    ("Describe" 'CLOS-BROWSER::DESCRIBE-METHOD "Describe this method."
     ("Documentation" 'DOCUMENTATION "Print this method's documentation."))))
 ("Delete" 'DELETE "Remove this method.")
 ("Copy" 'CLOS-BROWSER::COPY "Copy this method to boxed class.")
 ("Move" 'WEB:MOVE "Move this method to boxed class.")
 ("Rename" 'CLOS-BROWSER::RENAME "Change the name of this method to new name you specify")
 ("Override" 'CLOS-BROWSER::OVERRIDE "Create a local method with this name.")
 ("Break" 'CLOS::BREAK-METHOD "Cause a break window whenever this method is invoked.")
 ("Trace" 'CLOS::TRACE-METHOD "Trace this method.")
 ("UnBreak" 'CLOS::UNBREAK-METHOD "Unbreak this method.")
 ("Who owns" 'CLOS-BROWSER::WHO-OWNS "Show the classes on which this method is specialized."))))
```

```
(DEFMETHOD CLOS-BROWSER::OBJECT-NAME ((CLOS-BROWSER::SELF CLOS-BROWSER::CLOS-BROWSER-NODE)
 (WEB:NODE-NAME CLOS-BROWSER::SELF))
```

```
(DEFMETHOD CLOS-BROWSER::OVERRIDE ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
 (CLOS-BROWSER::METHOD)
 "Create a method specialized on the class."
 (ADD-METHOD CLOS-BROWSER::NODE NIL (SLOT-VALUE (CLOS::METHOD-GENERIC-FUNCTION CLOS-BROWSER::METHOD)
 'CLOS::NAME)))
```

```
(DEFMETHOD CLOS-BROWSER::CACHE (CLOS-BROWSER::MENU (CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
 &OPTIONAL CLOS-BROWSER::INHERITED-OR-ALL)
 (LET ((CLOS-BROWSER::MENU-TYPE (CASE CLOS-BROWSER::INHERITED-OR-ALL
 ((NIL :LOCAL) 'CLOS-BROWSER::LOCAL-METHODS-MENU)
 (:INHERITED 'CLOS-BROWSER::INHERITED-METHODS-MENU)
 (:ALL 'CLOS-BROWSER::ALL-METHODS-MENU))))
 (IF (NOT (ASSOC CLOS-BROWSER::MENU-TYPE (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::MENU-CACHE)))
 ;; then initialize alist
 (SETF (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::MENU-CACHE)
 (ACONS CLOS-BROWSER::MENU-TYPE CLOS-BROWSER::MENU (SLOT-VALUE CLOS-BROWSER::NODE
 'CLOS-BROWSER::MENU-CACHE)))
 ;; otherwise replace what is already there
 (RPLACD (ASSOC CLOS-BROWSER::MENU-TYPE (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::MENU-CACHE))
 CLOS-BROWSER::MENU))))
```

```
(DEFMETHOD CLOS-BROWSER::UNCACHE ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
 &OPTIONAL CLOS-BROWSER::INHERITED-OR-ALL)
 (RPLACD (ASSOC (CASE CLOS-BROWSER::INHERITED-OR-ALL
 ((NIL :LOCAL) 'CLOS-BROWSER::LOCAL-METHODS-MENU)
 (:INHERITED 'CLOS-BROWSER::INHERITED-METHODS-MENU)
 (:ALL 'CLOS-BROWSER::ALL-METHODS-MENU))
 (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::MENU-CACHE))
 NIL))
```

```
(IL:RPAQ CLOS-BROWSER::*METHOD-PROMPT-STRING* (CONCATENATE 'STRING "Left button to edit the method." "\
"
"Middle button provides a menu of operations."))
```



```

(DEFUN CLOS-BROWSER::EDIT (CLOS-BROWSER::METHOD)
  (LET ((*PACKAGE* (SYMBOL-PACKAGE (CLOS::GENERIC-FUNCTION-NAME (CLOS::METHOD-GENERIC-FUNCTION
    CLOS-BROWSER::METHOD))))
    (ED (CLOS::FULL-METHOD-NAME CLOS-BROWSER::METHOD)
      ' :DONTWAIT)))

(DEFUN CLOS-BROWSER::MAKE-METHOD-MENU-ITEMS (CLOS::METHODS CLOS-BROWSER::CLASS &OPTIONAL
  CLOS-BROWSER::INHERITED-OR-ALL)
  "gather method-list into menu items list"
  (LET ((CLOS-BROWSER::METHOD-MENU-ITEMS (CLOS-BROWSER::MAKE-TOP-LEVEL-METHOD-MENU-ITEMS CLOS::METHODS
    CLOS-BROWSER::INHERITED-OR-ALL))
    (CLOS-BROWSER::EXTRA-MENU-ITEM-POSITIONS))
    (LET ((CLOS-BROWSER::PREVIOUS.ITEM NIL)
      (CLOS-BROWSER::THIS.POSITION 0)
      CLOS-BROWSER::GF-NAME)
      (DOLIST (CLOS-BROWSER::THIS.ITEM CLOS-BROWSER::METHOD-MENU-ITEMS)
        (SETQ CLOS-BROWSER::GF-NAME (CAR CLOS-BROWSER::THIS.ITEM))
        (INCF CLOS-BROWSER::THIS.POSITION)
        (IF (NOT (AND CLOS-BROWSER::PREVIOUS.ITEM (IF (NOT (FIRST CLOS-BROWSER::THIS.ITEM))
          ;; then look for different gf objects with nil name
          (EQ (CLOS::METHOD-GENERIC-FUNCTION (SECOND
            CLOS-BROWSER::PREVIOUS.ITEM)
              )
              (CLOS::METHOD-GENERIC-FUNCTION (SECOND
                CLOS-BROWSER::THIS.ITEM)
              )))
            ;; otherwise use slightly more efficient test for same gf
            (EQ (FIRST CLOS-BROWSER::PREVIOUS.ITEM)
              (FIRST CLOS-BROWSER::THIS.ITEM))))))
          ;; then go on to the next
          (SETQ CLOS-BROWSER::PREVIOUS.ITEM CLOS-BROWSER::THIS.ITEM)
          ;; otherwise we have multi-methods
          (PROGN ;; build a sub-menu of all the multi-methods
            (IF (NOT (FOURTH CLOS-BROWSER::PREVIOUS.ITEM))
              ;; then create the sub-menu
              (NCONC CLOS-BROWSER::PREVIOUS.ITEM (LIST (LIST 'IL:SUBITEMS (
                CLOS-BROWSER::MAKE-MULTI-METHOD-SUB-MENU
                (SECOND
                  CLOS-BROWSER::PREVIOUS.ITEM)
                )
                CLOS-BROWSER::CLASS
                )
                (
                  CLOS-BROWSER::MAKE-MULTI-METHOD-SUB-MENU
                  (SECOND CLOS-BROWSER::THIS.ITEM)
                  CLOS-BROWSER::CLASS)))
                ;; otherwise add another item to the sub-menu
                (NCONC (FOURTH CLOS-BROWSER::PREVIOUS.ITEM)
                  (LIST (CLOS-BROWSER::MAKE-MULTI-METHOD-SUB-MENU (SECOND
                    CLOS-BROWSER::THIS.ITEM)
                    CLOS-BROWSER::CLASS))))
                ;; collect the position of the extra multi-method menu item
                (PUSH CLOS-BROWSER::THIS.POSITION CLOS-BROWSER::EXTRA-MENU-ITEM-POSITIONS))))))
            ;; remove extra multi-method menu items last first.
            (DOLIST (CLOS-BROWSER::EACH.POSITION CLOS-BROWSER::EXTRA-MENU-ITEM-POSITIONS)
              (SETQ CLOS-BROWSER::METHOD-MENU-ITEMS (DELETE-IF #'XCL:TRUE CLOS-BROWSER::METHOD-MENU-ITEMS :START
                (- CLOS-BROWSER::EACH.POSITION 1)
                :END CLOS-BROWSER::EACH.POSITION)))
            ;; prepend the Add method item
            (APPEND ' ("Add method" NIL "Bring up an editor containing a template for a new method on this class.")
              CLOS-BROWSER::METHOD-MENU-ITEMS)))

(DEFUN CLOS-BROWSER::MAKE-TOP-LEVEL-METHOD-MENU-ITEMS (CLOS::METHODS &OPTIONAL
  CLOS-BROWSER::INHERITED-OR-ALL)
  "gather local-methods into menu items list"
  (DECLARE (SPECIAL CLOS-BROWSER::*METHOD-PROMPT-STRING*))
  (SORT (IL:FOR CLOS-BROWSER::EACH.METHOD IL:IN CLOS::METHODS IL:BIND CLOS-BROWSER::METHOD-NAME
    IL:UNLESS (AND (NOT (EQL CLOS-BROWSER::INHERITED-OR-ALL :ALL))
      (CLOS::*TYPEP CLOS-BROWSER::EACH.METHOD 'CLOS::STANDARD-ACCESSOR-METHOD))
    ;; weed out auto-generated slot access methods

```

```

IL:|eachtime| (SETQ CLOS-BROWSER::METHOD-NAME (CAR (CLOS::FULL-METHOD-NAME CLOS-BROWSER::EACH.METHOD
                                                    NIL)))
IL:|collect| (LIST CLOS-BROWSER::METHOD-NAME CLOS-BROWSER::EACH.METHOD
                  CLOS-BROWSER::*METHOD-PROMPT-STRING*)
#' IL:ALPHORDER :KEY #'CAR)

```

```

(DEFUN CLOS-BROWSER::MAKE-MULTI-METHOD-SUB-MENU (CLOS-BROWSER::METHOD CLOS-BROWSER::CLASS)
  "make a menu item to distinguish methods on the same gf"
  (LET (CLOS-BROWSER::SUB-ITEM-NAME)
    (DECLARE (SPECIAL CLOS-BROWSER::*METHOD-PROMPT-STRING*))
    ;; first put out the qualifiers if any
    (DOLIST (CLOS-BROWSER::QUALIFIER (SLOT-VALUE CLOS-BROWSER::METHOD 'CLOS::SPECIALIZERS))
      (SETQ CLOS-BROWSER::SUB-ITEM-NAME (CONCATENATE 'STRING CLOS-BROWSER::SUB-ITEM-NAME (WHEN
                                                                                          CLOS-BROWSER::SUB-ITEM-NAME
                                                                                          " ")
                                                    (PRIN1-TO-STRING CLOS-BROWSER::QUALIFIER))))
    ;; then do the specializers
    ;; (DOLIST (TYPE-SPECIFIER (SLOT-VALUE METHOD 'CLOS::TYPE-SPECIFIERS)) (SETQ SUB-ITEM-NAME (CONCATENATE 'STRING
    ;; SUB-ITEM-NAME (WHEN SUB-ITEM-NAME " ") (IF (EQ CLASS TYPE-SPECIFIER) ;; then lets just do a plus sign "+" ;; else print the name
    ;; (PRIN1-TO-STRING ;; test until class-name works properly (IF (TYPEP TYPE-SPECIFIER 'STANDARD-CLASS) (CLASS-NAME
    ;; TYPE-SPECIFIER) TYPE-SPECIFIER))))))
    (LIST CLOS-BROWSER::SUB-ITEM-NAME CLOS-BROWSER::METHOD CLOS-BROWSER::*METHOD-PROMPT-STRING*))
  )
)
;;
;; OPERATORS (via CLOS-BROWSER-NODE) ON CLOS::STANDARD-CLASS

```

```

(DEFMETHOD CLOS-BROWSER::ADD-BROWSER-METHOD ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
                                               &OPTIONAL CLOS-BROWSER::FORM CLOS-BROWSER::METHOD-NAME)
  "bring up sedit on a template to add a method to this class"
  (DECLARE (SPECIAL SEDIT::BASIC-GAP SEDIT::BODY-GAP SEDIT::ARGS-GAP))
  (LET* ((CLASS-NAME (CLASS-NAME (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::CLASS)))
         CLOS-BROWSER::CONTEXT
         (CLOS-BROWSER::NAME (FORMAT NIL "New method on ~A" CLASS-NAME))
         (*PACKAGE* (SYMBOL-PACKAGE CLASS-NAME)))
    (UNLESS CLOS-BROWSER::FORM
      (SETQ CLOS-BROWSER::FORM (LIST 'DEFMETHOD (OR CLOS-BROWSER::METHOD-NAME SEDIT::BASIC-GAP)
                                     (LIST (LIST (INTERN "SELF")
                                                CLASS-NAME)
                                           SEDIT::ARGS-GAP)
                                     SEDIT::BODY-GAP)))
      (SEDIT:EDIT CLOS-BROWSER::FORM (LIST :NAME CLOS-BROWSER::NAME :COMPLETION-FN
                                           #'CLOS-BROWSER::COMPLETE-ADD-METHOD)
                 :DONTWAIT)))
  )

```

```

(DEFMETHOD CLOS-BROWSER::BROWSE-SUBS ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
                                       (CLOS-BROWSER::BROWSE-CLASS (SLOT-VALUE (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::CLASS)
                                     'CLOS::NAME)))
  )

```

```

(DEFMETHOD CLOS-BROWSER::EDIT-CLASS ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
                                       (LET* ((CLOS-BROWSER::CLASS (CLASS-NAME (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::CLASS)))
                                              (*PACKAGE* (SYMBOL-PACKAGE CLOS-BROWSER::CLASS)))
     (ED CLOS-BROWSER::CLASS ' (CLOS-BROWSER::CLASSES :DONTWAIT))))
  )

```

```

(DEFMETHOD CLOS-BROWSER::INSPECT-CLASS ((CLOS::OBJECT CLOS-BROWSER::CLOS-BROWSER-NODE)
                                           (INSPECT (SLOT-VALUE CLOS::OBJECT 'CLOS-BROWSER::CLASS)))
  )

```

```

(DEFMETHOD CLOS-BROWSER::MENU-METHODS ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
                                           &OPTIONAL CLOS-BROWSER::INHERITED-OR-ALL CLOS-BROWSER::ITEMS
                                           CLOS-BROWSER::FIX-FLAG CLOS-BROWSER::RECOMPUTE-FLAG)
  "pops up a menu of the methods for the class representing the node."
  ;; If INHERITED-OR-ALL is NIL or :local only local methods are menued.
  ;; If INHERITED-OR-ALL is :inherited only inherited methods are menued.
  ;; If INHERITED-OR-ALL is :all all methods are menued.
  ;; If items are present, the list of methods is not re-generated.
  ;; If the fix-flag is t, the user is asked to position the menu and no "Fix menu" item appears.
  ;; The whenselectedfn can call this again to generate a fixed menu.
  (LET* ((CLOS-BROWSER::CLASS (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::CLASS))
         (*PACKAGE* (SYMBOL-PACKAGE (SLOT-VALUE CLOS-BROWSER::CLASS 'CLOS::NAME)))
         (CLOS-BROWSER::MENU (UNLESS (OR CLOS-BROWSER::RECOMPUTE-FLAG (EQ (SLOT-VALUE CLOS-BROWSER:CLOS-ICON
                                                                                          '
                                                                                          CLOS-BROWSER::MENU-CACHE-SWITCH)
                                                                                          )
                                     :NONE)

```

```

(REST ; use the cached menu
  (ASSOC (CASE CLOS-BROWSER::INHERITED-OR-ALL
    ((NIL :LOCAL) 'CLOS-BROWSER::LOCAL-METHODS-MENU)
    (:INHERITED 'CLOS-BROWSER::IHHERITED-METHODS-MENU)
    (:ALL 'CLOS-BROWSER::ALL-METHODS-MENU))
    (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::MENU-CACHE))))))
;; unless it was cached, make the menu
(UNLESS (AND CLOS-BROWSER::MENU (IL:TYPE? IL:MENU CLOS-BROWSER::MENU))
  ;; unless the menu items were passed in, compute them
  (UNLESS CLOS-BROWSER::ITEMS
    (SETQ CLOS-BROWSER::ITEMS (CLOS-BROWSER::MAKE-METHOD-MENU-ITEMS
      (CASE CLOS-BROWSER::INHERITED-OR-ALL
        ((NIL :LOCAL) (CAR (SLOT-VALUE CLOS-BROWSER::CLASS
          'CLOS::DIRECT-METHODS)))
        (:INHERITED (CLOS::COMPUTE-INHERITED-METHODS CLOS-BROWSER::CLASS
          ))
        (:ALL (CLOS::COMPUTE-INHERITED-METHODS CLOS-BROWSER::CLASS :ALL)
          CLOS-BROWSER::CLASS)))
    ))
  ;; create the menu using whenselectedfn
  (SETQ CLOS-BROWSER::MENU (IL:CREATE IL:MENU
    IL:TITLE IL:_ (IF CLOS-BROWSER::FIX-FLAG
      (CLASS-NAME CLOS-BROWSER::CLASS)
      "methods")
    IL:MENUFONT IL:_ (WHEN (> (LENGTH CLOS-BROWSER::ITEMS)
      (SLOT-VALUE CLOS-BROWSER::NODE
        'CLOS-BROWSER::LARGE-MENU-SIZE))
      (SLOT-VALUE CLOS-BROWSER::NODE
        'CLOS-BROWSER::LARGE-MENU-FONT))
    IL:MENUUSERDATA IL:_ '(:ESCAPE T)
      ; cause symbols to print in mouse process's read-table &
      ; package
    IL:WHENSELECTEDFN IL:_ (CLOS-BROWSER::MAKE-WHENSELECTEDFN
      CLOS-BROWSER::NODE
      CLOS-BROWSER::INHERITED-OR-ALL
      CLOS-BROWSER::ITEMS)
    IL:ITEMS IL:_ (APPEND CLOS-BROWSER::ITEMS
      (UNLESS CLOS-BROWSER::FIX-FLAG
        '("Fix menu" NIL "Place this menu on the
          screen. WARNING: cached menus
          are not kept up-to-date")))))
  ;; cache the menu on the node
  (CLOS-BROWSER::CACHE CLOS-BROWSER::MENU CLOS-BROWSER::NODE CLOS-BROWSER::INHERITED-OR-ALL))
(IF CLOS-BROWSER::FIX-FLAG
  ;; ask user to position menu
  (IL:MOVEW (IL:ADDMENU CLOS-BROWSER::MENU))
  ;; otherwise just pop it up
  (IL:MENU CLOS-BROWSER::MENU)))

```

```

(DEFMETHOD CLOS-BROWSER::MAKE-WHENSELECTEDFN ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
  &OPTIONAL CLOS-BROWSER::INHERITED-OR-ALL
  CLOS-BROWSER::ITEMS)

```

```

  (LAMBDA
    (CLOS-BROWSER::MENU-ITEM IGNORE CLOS-BROWSER::MOUSE-KEY)
    (LET ((CLOS-BROWSER::METHOD-NAME (FIRST CLOS-BROWSER::MENU-ITEM))
      (CLOS-BROWSER::METHOD (SECOND CLOS-BROWSER::MENU-ITEM)))
      (IF (NULL CLOS-BROWSER::METHOD)
        ;; do the non-method items
        (COND
          ((STRING= CLOS-BROWSER::METHOD-NAME "Add method")
            (CLOS-BROWSER::ADD-BROWSER-METHOD ',CLOS-BROWSER::NODE NIL))
          ((STRING= CLOS-BROWSER::METHOD-NAME "Fix menu")
            ;; call MENU-LOCAL-METHODS again to create fixed menu
            (CLOS-BROWSER::MENU-METHODS ',CLOS-BROWSER::NODE ',CLOS-BROWSER::INHERITED-OR-ALL
              ',CLOS-BROWSER::ITEMS T))
          (T CLOS-BROWSER::OPERATION))
        ;; got a method, lets get an operation
        (LET ((CLOS-BROWSER::OPERATION
          (CASE CLOS-BROWSER::MOUSE-KEY
            (IL:LEFT 'CLOS-BROWSER::EDIT)
            (IL:MIDDLE (IL:MENU (IL:CREATE IL:MENU
              IL:TITLE IL:_ CLOS-BROWSER::METHOD-NAME
              IL:ITEMS IL:_
              (SLOT-VALUE ',CLOS-BROWSER::NODE
                ', (CASE CLOS-BROWSER::INHERITED-OR-ALL
                  ((NIL :LOCAL)

```

```

)
(CLOS-BROWSER::LOCAL-METHOD-OPERATIONS
(:INHERITED
CLOS-BROWSER::INHERITED-METHOD-OPERATIONS
(:ALL 'CLOS-BROWSER::ALL-METHOD-OPERATIONS))))
)))
;; got an operation, lets use it on the method
(CASE CLOS-BROWSER::OPERATION
(NIL) NIL
(CLOS-BROWSER::COPY WEB:MOVE) ; need to supply destination
(FUNCALL CLOS-BROWSER::OPERATION CLOS-BROWSER::METHOD
;; to class
(PROGN (UNLESS (SLOT-VALUE CLOS-BROWSER:CLOS-ICON
'CLOS-BROWSER::DESTINATION-BROWSER)
(ERROR "Please box a destination class, then say OK."))
(SLOT-VALUE (SLOT-VALUE (SLOT-VALUE CLOS-BROWSER:CLOS-ICON
'CLOS-BROWSER::DESTINATION-BROWSER)
'WEB:BOXED-NODE)
'CLOS-BROWSER::CLASS))
;; from class
(SLOT-VALUE 'CLOS-BROWSER::NODE 'CLOS-BROWSER::CLASS))
(DELETE) ; need to supply extra confirm
(WHEN (IL:MOUSECONFIRM (FORMAT NIL "Are you sure you wish to delete the ~A method?"
(CLOS::FULL-METHOD-NAME CLOS-BROWSER::METHOD)))
(FUNCALL CLOS-BROWSER::OPERATION CLOS-BROWSER::METHOD))
(CLOS-BROWSER::OVERRIDE) ; use add-method
(FUNCALL CLOS-BROWSER::OPERATION 'CLOS-BROWSER::NODE CLOS-BROWSER::METHOD))
(OTHERWISE (FUNCALL CLOS-BROWSER::OPERATION CLOS-BROWSER::METHOD))))))

(DEFMETHOD CLOS-BROWSER::DESCRIBE-CLASS ((CLOS-BROWSER::SELF CLOS-BROWSER::CLOS-BROWSER-NODE))
(CLOS::DESCRIBE-OBJECT (SLOT-VALUE CLOS-BROWSER::SELF 'CLOS-BROWSER::CLASS)
*TRACE-OUTPUT*))

(DEFMETHOD CLOS-BROWSER::DOCUMENTATION-CLASS ((CLOS-BROWSER::SELF CLOS-BROWSER::CLOS-BROWSER-NODE))
(DOCUMENTATION (SLOT-VALUE CLOS-BROWSER::SELF 'CLOS-BROWSER::CLASS)))

(DEFMETHOD CLOS-BROWSER::PRINT-CLASS ((CLOS-BROWSER::SELF CLOS-BROWSER::CLOS-BROWSER-NODE))
(PPRINT (IL:GETDEF (SLOT-VALUE (SLOT-VALUE CLOS-BROWSER::SELF 'CLOS-BROWSER::CLASS)
'CLOS::NAME)
'CLOS-BROWSER::CLASSES)))

(DEFMETHOD CLOS-BROWSER::SPECIALIZE-CLASS ((CLOS-BROWSER::NODE CLOS-BROWSER::CLOS-BROWSER-NODE)
&OPTIONAL CLOS-BROWSER::FORM CLOS-BROWSER::NEW-CLASS-NAME)
(CLOS-BROWSER::SPECIALIZE (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::CLASS)
CLOS-BROWSER::FORM CLOS-BROWSER::NEW-CLASS-NAME))

(DEFUN CLOS-BROWSER::COMPLETE-ADD-METHOD (CLOS-BROWSER::CONTEXT STRUCTURE &OPTIONAL (
CLOS-BROWSER::CHANGED?
T))
(DECLARE (IGNORE CLOS-BROWSER::CONTEXT))
(CASE CLOS-BROWSER::CHANGED?
((:ABORT NIL) NIL)
(OTHERWISE (EVAL (COPY-TREE
STRUCTURE)))))) ; to ensure the original list does not get destructively clobbered

(DEFUN CLOS-BROWSER::COMPLETE-SPECIALIZE (IGNORE STRUCTURE CLOS-BROWSER::CHANGED?)
(DECLARE (IGNORE CLOS-BROWSER::CONTEXT))
(CASE CLOS-BROWSER::CHANGED?
((:ABORT NIL) NIL)
(T (LET ((CLOS-BROWSER::ORIGINALCURSOR (IL:CURSOR)))
(UNWIND-PROTECT
(PROGN (IL:SETCURSOR IL:WAITINGCURSOR)
(LET ((CLOS-BROWSER::SUB-CLASS (EVAL (COPY-TREE
; so original list does not get clobbered if this class's name
; changes
STRUCTURE))))
CLOS-BROWSER::SUPER-CLASS)
;; check for bug
(WHEN (SYMBOLP CLOS-BROWSER::SUB-CLASS)
(SETQ CLOS-BROWSER::SUB-CLASS (FIND-CLASS CLOS-BROWSER::SUB-CLASS)))
(DOLIST (CLOS-BROWSER::BROWSER (SLOT-VALUE CLOS-BROWSER:CLOS-ICON
'CLOS-BROWSER::CLASS-BROWSERS))
(DOLIST (CLOS-BROWSER::SUPER-CLASS (SLOT-VALUE CLOS-BROWSER::SUB-CLASS
'CLOS::DIRECT-SUPERCLASSES))
(WHEN (CLOS-BROWSER::CONTAINS-P CLOS-BROWSER::SUPER-CLASS
CLOS-BROWSER::BROWSER)

```

```

(CLOS-BROWSER::ADD-ROOT CLOS-BROWSER::BROWSER CLOS-BROWSER::SUB-CLASS
)
(RETURN))))))
(IL:SETCURSOR CLOS-BROWSER::ORIGINALCURSOR))))))

```

```

(DEFUN CLOS-BROWSER::LYRIC-COMPLETE-SPECIALIZE (IGNORE STRUCTURE)
(LET ((CLOS-BROWSER::ORIGINALCURSOR (IL:CURSOR))
      (UNWIND-PROTECT
       (PROGN (IL:SETCURSOR IL:WAITINGCURSOR)
              (LET ((CLOS-BROWSER::SUB-CLASS (EVAL (COPY-TREE
; so original list does not get clobbered if this class's name
; changes
STRUCTURE)))
                CLOS-BROWSER::SUPER-CLASS)
; check for bug
(WHEN (SYMBOLP CLOS-BROWSER::SUB-CLASS)
      (SETQ CLOS-BROWSER::SUB-CLASS (CLOS::SYMBOL-CLASS CLOS-BROWSER::SUB-CLASS)))
(DOLIST (CLOS-BROWSER::BROWSER (SLOT-VALUE CLOS-BROWSER:CLOS-ICON
      'CLOS-BROWSER::CLASS-BROWSERS))
      (DOLIST (CLOS-BROWSER::SUPER-CLASS (SLOT-VALUE CLOS-BROWSER::SUB-CLASS
      'CLOS::LOCAL-SUPERS))
              (WHEN (CLOS-BROWSER::CONTAINS-P CLOS-BROWSER::SUPER-CLASS CLOS-BROWSER::BROWSER)
                (CLOS-BROWSER::ADD-ROOT CLOS-BROWSER::BROWSER CLOS-BROWSER::SUB-CLASS)
                (RETURN))))))
      (IL:SETCURSOR CLOS-BROWSER::ORIGINALCURSOR))))))

```

```

(DEFUN CLOS-BROWSER::THIS-CLASS-NODE-P (CLOS-BROWSER::CLASS CLOS-BROWSER::NODE)
(EQ CLOS-BROWSER::CLASS (SLOT-VALUE CLOS-BROWSER::NODE 'CLOS-BROWSER::CLASS)))

```

```

(DEFUN CLOS::CLASS-DIRECT-METHODS (CLOS::CLASS)
(SLOT-VALUE CLOS::CLASS 'CLOS::DIRECT-METHODS))

```

;;  
;; OPERATORS ON CLOS::STANDARD-CLASS (directly)

```

(DEFMETHOD CLOS::COMPUTE-INHERITED-METHODS ((CLOS::SELF STANDARD-CLASS)
&OPTIONAL CLOS::ALL-FLAG)
"Compute and return all inherited methods of a class. If all-flag eq :all then methods on t and the passed
class are included."
;; The following does not use generic function dispatch-orders, discriminating-functions, or classical-method-tables.
;; For each method in the direct-methods of each inherited class in the class-precedence-list for the class of interest, in class precedence order
;; check to see if we have already analyzed its generic function.
;; If it is a new gf then if there is exactly one type specifier then add the direct method to the list of inherited methods.
;; If there is more than one type specifier then for every method in the gf for each specializer if the specializing class is equal to or later than the
;; current class in the class precedence list, ignoring t, pushnew the method on the list of inherited methods.
(LET ((CLOS::FILTERED-CLASSES NIL)
      (CLOS::MY-GFS NIL)
      (CLOS::CLASS-PRECEDENCE-LIST (SLOT-VALUE CLOS::SELF 'CLOS::CLASS-PRECEDENCE-LIST))
      (CLOS::INHERITED-METHODS NIL)
      (CLOS::DIRECT-METHODS (CAR (SLOT-VALUE CLOS::SELF 'CLOS::DIRECT-METHODS)))
      (CLOS::T-CLASS (FIND-CLASS 'T)))
      (UNLESS (EQ CLOS::ALL-FLAG :ALL) ; ignore t and the bottom class
        (PUSH CLOS::T-CLASS CLOS::FILTERED-CLASSES)
        (PUSH CLOS::SELF CLOS::FILTERED-CLASSES)
        (SETQ CLOS::MY-GFS (MAPCAR #'CLOS::METHOD-GENERIC-FUNCTION CLOS::DIRECT-METHODS)))
      (DOLIST (CLOS::CLASS CLOS::CLASS-PRECEDENCE-LIST)
        (UNLESS (MEMBER CLOS::CLASS CLOS::FILTERED-CLASSES)
          (DOLIST (CLOS::DIRECT-METHOD (CAR (CLOS::CLASS-DIRECT-METHODS CLOS::CLASS)))
            (LET ((CLOS::GF (CLOS::METHOD-GENERIC-FUNCTION CLOS::DIRECT-METHOD))
                  (UNLESS (MEMBER CLOS::GF CLOS::MY-GFS :TEST #'EQ)
                    (IF (= 1 (LENGTH (SLOT-VALUE CLOS::DIRECT-METHOD 'CLOS::SPECIALIZERS))
; Note: this check relies on guaranteed congruent lambda lists.
; There should be some way to query the gf directly.
                    )
                  )
            (PUSH CLOS::DIRECT-METHOD CLOS::INHERITED-METHODS)
            )
          )
        (DOLIST (CLOS::GF-METHOD (SLOT-VALUE CLOS::GF 'CLOS::METHODS))
          (DOLIST (CLOS::SPECIFIER (SLOT-VALUE CLOS::GF-METHOD 'CLOS::SPECIALIZERS))
            (UNLESS (OR (EQ CLOS::T-CLASS CLOS::SPECIFIER)
                        (NOT (MEMBER CLOS::SPECIFIER CLOS::CLASS-PRECEDENCE-LIST
:TEST #'EQ)))
              (PUSHNEW CLOS::GF-METHOD CLOS::INHERITED-METHODS)
              (RETURN))))))
          (PUSH CLOS::GF CLOS::MY-GFS)))
      (CLOS::INHERITED-METHODS))

```

```

(DEFMETHOD CLOS-BROWSER::SPECIALIZE ((CLOS-BROWSER::CLASS STANDARD-CLASS)
&OPTIONAL CLOS-BROWSER::FORM CLOS-BROWSER::NEW-CLASS-NAME)
  (DECLARE (SPECIAL SEDIT::BASIC-GAP))
  (LET* ((CLASS-NAME (CLASS-NAME CLOS-BROWSER::CLASS))
        CLOS-BROWSER::CONTEXT
        (CLOS-BROWSER::NAME (FORMAT NIL "New sub-class of ~A" CLASS-NAME))
        (*PACKAGE* (SYMBOL-PACKAGE CLASS-NAME)))
    (UNLESS CLOS-BROWSER::FORM
      (SETQ CLOS-BROWSER::FORM (LIST 'DEFCLASS (OR CLOS-BROWSER::NEW-CLASS-NAME SEDIT::BASIC-GAP)
                                     (LIST CLASS-NAME)
                                     (LIST SEDIT::BODY-GAP))))
    ;; call sedit
    (SEMIT:SEMIT CLOS-BROWSER::FORM (LIST :NAME CLOS-BROWSER::NAME :COMPLETION-FN
                                           #'CLOS-BROWSER::COMPLETE-SPECIALIZE)
                 :DONTWAIT)))

(DEFMETHOD CLOS-BROWSER::SUBCLASSES-OF ((CLOS-BROWSER::CLASS STANDARD-CLASS))
  (APPEND (LIST CLOS-BROWSER::CLASS)
    (IL:FOR CLOS-BROWSER::SUBCLASS IL:IN (SLOT-VALUE CLOS-BROWSER::CLASS 'CLOS::DIRECT-SUBCLASSES)
      IL:JOIN (IF (SLOT-VALUE CLOS-BROWSER::SUBCLASS 'CLOS::DIRECT-SUBCLASSES)
                  (CLOS-BROWSER::SUBCLASSES-OF CLOS-BROWSER::SUBCLASS)
                  (LIST CLOS-BROWSER::SUBCLASS))))))

;;
;; OPERATORS ON CLOS::STANDARD-METHOD

(DEFMETHOD CLOS-BROWSER::DELETE-METHOD ((CLOS-BROWSER::METHOD STANDARD-METHOD))
  (REMOVE-METHOD (SLOT-VALUE CLOS-BROWSER::METHOD 'CLOS::GENERIC-FUNCTION)
                  CLOS-BROWSER::METHOD))

(DEFMETHOD CLOS-BROWSER::COPY ((CLOS-BROWSER::METHOD STANDARD-METHOD)
                                (CLOS-BROWSER::TO-CLASS STANDARD-CLASS)
                                &OPTIONAL CLOS-BROWSER::FROM-CLASS)
  (WHEN (EQ CLOS-BROWSER::TO-CLASS CLOS-BROWSER::FROM-CLASS)
    (RETURN-FROM CLOS-BROWSER::COPY))
  ;; if we have the source code, find all the references to the from class, change them to the to-class, and evaluate the new form.  If from-class is not
  ;; provided, if method is specialized on just one class, use it, otherwise ask the user.
  ;; If we dont have source code, we could ask if you want to just move the method object, but instead we print a complaint and punt.
  (LET ((CLOS-BROWSER::METHOD-DEFINITION (COPY-TREE (XCL:IGNORE-ERRORS (IL:GETDEF (CLOS::FULL-METHOD-NAME
                                                                                CLOS-BROWSER::METHOD)
                                                                                'CLOS-BROWSER::METHODS))))
        (CLOS-BROWSER::NON-T-CLASSES (MAPCAR #'(LAMBDA (CLOS-BROWSER::CLASS)
                                                (UNLESS (EQ CLOS-BROWSER::CLASS 'T)
                                                    CLOS-BROWSER::CLASS)
                                                (CLOS::METHOD-SPECIALIZERS CLOS-BROWSER::METHOD))))
        (UNLESS CLOS-BROWSER::METHOD-DEFINITION
          (FORMAT T "The definition for ~A is not loaded" (CLOS::FULL-METHOD-NAME CLOS-BROWSER::METHOD NIL))
          (RETURN-FROM CLOS-BROWSER::COPY NIL))
        (IF CLOS-BROWSER::FROM-CLASS
          ;; method should be specialized on from-class.
          (UNLESS (MEMBER CLOS-BROWSER::FROM-CLASS CLOS-BROWSER::NON-T-CLASSES)
            (ERROR "The ~A method is not specialized on the ~A class" (CLOS::FULL-METHOD-NAME
                                                                    CLOS-BROWSER::METHOD NIL)
                  (CLASS-NAME CLOS-BROWSER::FROM-CLASS)))
          ;; otherwise see if we can deduce FROM-CLASS
          (CASE (LENGTH CLOS-BROWSER::NON-T-CLASSES)
            (0 (FORMAT T "Unspecialized methods cannot be copied. ~A" (CLOS::FULL-METHOD-NAME
                                                                    CLOS-BROWSER::METHOD NIL)))
            (1 (SETQ CLOS-BROWSER::FROM-CLASS (CAR CLOS-BROWSER::NON-T-CLASSES)))
            (OTHERWISE (SETQ CLOS-BROWSER::FROM-CLASS (CLOS::SYMBOL-CLASS (IL:PROMPTFORWORD
                                                                    (FORMAT NIL "Which class in ~A do
                                                                    you wish to move from?"
                                                                    (CLOS::FULL-METHOD-NAME
                                                                    CLOS-BROWSER::METHOD NIL)
                                                                    ))))))))
          ;; should contain from-class.  If it is not the same, abort.
          (CLOS-BROWSER::REPLACE-SPECIALIZERS CLOS-BROWSER::METHOD-DEFINITION (CLASS-NAME
                                                                                CLOS-BROWSER::FROM-CLASS)
                                             (CLASS-NAME CLOS-BROWSER::TO-CLASS))
          (PRINT (EVAL CLOS-BROWSER::METHOD-DEFINITION))))))

(DEFMETHOD WEB:MOVE ((CLOS-BROWSER::METHOD STANDARD-METHOD)
                      (CLOS-BROWSER::TO-CLASS STANDARD-CLASS)
                      &OPTIONAL CLOS-BROWSER::FROM-CLASS)
  (WHEN (EQ CLOS-BROWSER::TO-CLASS CLOS-BROWSER::FROM-CLASS)

```

```

    (RETURN-FROM WEB:MOVE))
  (IF (CLOS-BROWSER::COPY CLOS-BROWSER::METHOD CLOS-BROWSER::TO-CLASS CLOS-BROWSER::FROM-CLASS)
      (CLOS-BROWSER::DELETE-METHOD CLOS-BROWSER::METHOD)
      (FORMAT T "copy of ~A to ~A failed" (XCL:IGNORE-ERRORS (CLOS::FULL-METHOD-NAME CLOS-BROWSER::METHOD))
              (XCL:IGNORE-ERRORS (CLASS-NAME CLOS-BROWSER::TO-CLASS))))))

(DEFMETHOD CLOS-BROWSER::PRINT-DEFINITION ((CLOS-BROWSER::SELF STANDARD-METHOD))
  (PPRINT (IL:GETDEF (CLOS::FULL-METHOD-NAME CLOS-BROWSER::SELF)
                    'CLOS-BROWSER::METHODS)))

(DEFMETHOD CLOS-BROWSER::DESCRIBE-METHOD ((CLOS-BROWSER::METHOD CLOS::METHOD))
  (CLOS::DESCRIBE-OBJECT CLOS-BROWSER::METHOD *TRACE-OUTPUT*))

(DEFMETHOD CLOS-BROWSER::RENAME ((CLOS-BROWSER::METHOD STANDARD-METHOD)
  &OPTIONAL CLOS-BROWSER::NEW-NAME)
  (UNLESS CLOS-BROWSER::NEW-NAME
    (SETQ CLOS-BROWSER::NEW-NAME (READ (MAKE-STRING-INPUT-STREAM (IL:PROMPTFORWARD (FORMAT NIL "~%New name
                                                                                   for ~A"
                                                                                   (
                                                                                     CLOS::FULL-METHOD-NAME
                                                                                     CLOS-BROWSER::METHOD
                                                                                     ))))))))
  (LET ((CLOS-BROWSER::METHOD-DEFINITION (XCL:IGNORE-ERRORS (IL:GETDEF CLOS-BROWSER::METHOD))))
    (UNLESS CLOS-BROWSER::METHOD-DEFINITION
      (FORMAT T "The definition for ~A is not loaded" (CLOS::FULL-METHOD-NAME CLOS-BROWSER::METHOD NIL))
      (RETURN-FROM CLOS-BROWSER::RENAME NIL))
    (IF (AND (SETF (SECOND CLOS-BROWSER::METHOD-DEFINITION)
                  CLOS-BROWSER::NEW-NAME)
            (PRINT (EVAL CLOS-BROWSER::METHOD-DEFINITION)))
        (DELETE CLOS-BROWSER::METHOD)
        (FORMAT T "~%Rename of ~A to ~A failed" (XCL:IGNORE-ERRORS (CLOS::FULL-METHOD-NAME
                                                                    CLOS-BROWSER::METHOD))
                CLOS-BROWSER::NEW-NAME))))))

(DEFMETHOD CLOS-BROWSER::UPDATE-CACHED-MENUES ((CLOS-BROWSER::METHOD STANDARD-METHOD)
  &OPTIONAL
  (CLOS-BROWSER::CACHE-SWITCH (SLOT-VALUE
                                CLOS-BROWSER:CLOS-ICON
                                '
                                CLOS-BROWSER::MENU-CACHE-SWITCH
                                )))
  "set cached menus for this method's class to nil"
  (LET ((CLOS-BROWSER::ORIGINALCURSOR (IL:CURSOR)))
    (UNWIND-PROTECT
      (PROGN (IL:SETCURSOR IL:WAITINGCURSOR)
             (DOLIST (CLOS-BROWSER::BROWSER (SLOT-VALUE CLOS-BROWSER:CLOS-ICON
                                                       'CLOS-BROWSER::CLASS-BROWSERS))
                   (DOLIST (CLOS-BROWSER::CLASS (SLOT-VALUE CLOS-BROWSER::METHOD 'CLOS::SPECIALIZERS))
                         ;; fix bug in the inconsistent way CLOS objects store T class specializers and do method lookup.
                         (WHEN (EQ CLOS-BROWSER::CLASS T)
                           (SETQ CLOS-BROWSER::CLASS (CLOS::SYMBOL-CLASS T)))
                           (LET ((CLOS-BROWSER::NODE (CLOS-BROWSER::BROWSER-CONTAINS-P CLOS-BROWSER::CLASS
                                                                                       CLOS-BROWSER::BROWSER)))
                             (WHEN CLOS-BROWSER::NODE
                               (CASE CLOS-BROWSER::CACHE-SWITCH
                                 (:LAZY
                                  (CLOS-BROWSER::UNCACHE CLOS-BROWSER::NODE)
                                  (CLOS-BROWSER::UNCACHE CLOS-BROWSER::NODE :ALL)
                                  (DOLIST (CLOS-BROWSER::SUB-CLASS (CLOS-BROWSER::SUBCLASSES-OF
                                                                    (SLOT-VALUE CLOS-BROWSER::NODE
                                                                    'CLOS-BROWSER::CLASS)))
                                        (WHEN (SETQ CLOS-BROWSER::NODE (CLOS-BROWSER::CONTAINS-P
                                                                        CLOS-BROWSER::SUB-CLASS
                                                                        CLOS-BROWSER::BROWSER))
                                          (CLOS-BROWSER::UNCACHE CLOS-BROWSER::NODE :INHERITED)
                                          (CLOS-BROWSER::UNCACHE CLOS-BROWSER::NODE :ALL))))))
                                 (:EAGER (PRINT ":eager method menu cacheing not yet implemented."))
                                 (OTHERWISE
                                  NIL ; do nothing
                                  ))))))))
    (IL:SETCURSOR CLOS-BROWSER::ORIGINALCURSOR))))))

(DEFMETHOD CLOS-BROWSER::WHO-OWNS ((CLOS-BROWSER::METHOD STANDARD-METHOD))
  (PRINT (CLOS::FULL-METHOD-NAME CLOS-BROWSER::METHOD)))

(DEFMETHOD ADD-METHOD :AFTER
  ((CLOS-BROWSER::GENERIC-FUNCTION STANDARD-GENERIC-FUNCTION)

```

```
(CLOS-BROWSER::METHOD STANDARD-METHOD))
"Update cached menus."
(LET (CLOS-BROWSER::CACHE-SWITCH)
  (WHEN (AND CLOS-BROWSER::METHOD (SLOT-VALUE CLOS-BROWSER:CLOS-ICON 'CLOS-BROWSER::CLASS-BROWSERS)
    ; there are some browsers
    (NOT (EQ (SETQ CLOS-BROWSER::CACHE-SWITCH (SLOT-VALUE CLOS-BROWSER:CLOS-ICON
    'CLOS-BROWSER::MENU-CACHE-SWITCH))
    :NONE))
    ; we want auto cache updating
  )
  (CLOS-BROWSER::UPDATE-CACHED-MENUES CLOS-BROWSER::METHOD CLOS-BROWSER::CACHE-SWITCH))
CLOS-BROWSER::GENERIC-FUNCTION))
```

```
(DEFUN CLOS-BROWSER::REPLACE-SPECIALIZERS (CLOS-BROWSER::METHOD-DEFINITION
  CLOS-BROWSER::FROM-CLASS-NAME
  CLOS-BROWSER::TO-CLASS-NAME &KEY
  CLOS-BROWSER::IN-LAMDA-LIST-ONLY-FLAG)
  (NSUBST CLOS-BROWSER::TO-CLASS-NAME CLOS-BROWSER::FROM-CLASS-NAME (IF CLOS-BROWSER::IN-LAMDA-LIST-ONLY-FLAG
    ;; get the lambda list
    (THIRD (MULTIPLE-VALUE-LIST
      (CLOS::PARSE-DEFMETHOD
        (CDR
          CLOS-BROWSER::METHOD-DEFINITION
        )))
    ; note this gets argument names as well as specializers. Usually
    ; not what you want. Needs to be made smarter to just get
    ; specializers.
    ;; otherwise do the whole method
    CLOS-BROWSER::METHOD-DEFINITION)))
```

```
::
;;; SETUP RELEASE INFO
```

```
(IL:RPAQ CLOS-BROWSER::RELEASE-ID "0.02")
(IL:RPAQ CLOS-BROWSER::SYSTEM-DATE (CAAR (IL:GETPROP 'IL:CLOS-BROWSER 'IL:FILEDATES)))
```

```
::
;;
;; SETUP BACKGROUND MENU
```

```
(DEFUN CLOS-BROWSER::IN-SELECT-PACKAGE ()
  "pops up a menu of packages"
  ; Edited 18-Mar-87 13:13 by sml
  ;
  ;; kirk: 16Mar88 modified for clos-browser
  (LET ((PACKAGE (IL:MENU (IL:create| IL:MENU
    IL:TITLE IL:_ "Select package"
    IL:ITEMS IL:_
    (IL:SORT (IL:for| PACKAGE IL:jn| (LIST-ALL-PACKAGES) IL:bind| IL:PACKAGE-NAME
    IL:collect| (IL:SETQ IL:PACKAGE-NAME (PACKAGE-NAME PACKAGE))
    ,(IL:CONCAT (OR (CAR (PACKAGE-NICKNAMES PACKAGE))
    IL:PACKAGE-NAME)
    ":")
    ', IL:PACKAGE-NAME
    ,(IL:CONCAT "Set the current package to " IL:PACKAGE-NAME
    ":"))
    (IL:FUNCTION (IL:LAMBDA (IL:X IL:Y)
      (IL:ALPHORDER (CAR IL:X)
        (CAR IL:Y))))
    IL:CENTERFLG IL:_ T))))
  (IL:if| PACKAGE
  IL:then| (IN-PACKAGE PACKAGE))))
```

```
(DEFUN CLOS-BROWSER::CLASSES-IN-PACKAGE (PACKAGE &OPTIONAL CLOS-BROWSER::MAP-ON-PACKAGE)
  "Retrieves a list of all the classes for a given package. When map-on-package is t this can be very slow."
  ;; The maphash is always fast, whereas for some strange reason map-on-package varies among packages greatly.
  (LET ((CLOS-BROWSER::CLASSES))
    (UNLESS (TYPEP PACKAGE 'PACKAGE)
      (SETQ PACKAGE (FIND-PACKAGE PACKAGE)))
    (IF CLOS-BROWSER::MAP-ON-PACKAGE
      (DO-SYMBOLS (CLOS-BROWSER::SYM PACKAGE)
        (IF (AND (EQ (SYMBOL-PACKAGE CLOS-BROWSER::SYM)
          PACKAGE)
          (CLOS::SYMBOL-CLASS CLOS-BROWSER::SYM T))
          (PUSH CLOS-BROWSER::SYM CLOS-BROWSER::CLASSES)))
      (MAPHASH #'(LAMBDA (CLOS-BROWSER::KEY CLOS-BROWSER::VAL)
        (IF (EQ (SYMBOL-PACKAGE CLOS-BROWSER::KEY)
```



```

      PACKAGE)
      (PUSH CLOS-BROWSER::KEY CLOS-BROWSER::CLASSES)))
    CLOS::*FIND-CLASS*)
  CLOS-BROWSER::CLASSES))

```

:: pushnew should eliminate this

```

(SETQ IL:|BackgroundMenuCommands| (REMOVE 'IL:|BrowseClass| IL:|BackgroundMenuCommands| :KEY #'CAR))
(PUSH '(IL:|BrowseClass| (CLOS-BROWSER:BROWSE-CLASS)
      "Bring up a class browser."
      (IL:SUBITEMS (IL:|all in a package| (CLOS-BROWSER:BROWSE-CLASS (
                                          CLOS-BROWSER::CLASSES-IN-PACKAGE
                                          (
                                          CLOS-BROWSER::IN-SELECT-PACKAGE
                                          )))
      "Select a package and browse all the classes defined in that package.)))
      IL:|BackgroundMenuCommands|)
(SETQ IL:|BackgroundMenu| NIL)
(IL:PUTPROPS IL:NEW-CLOS-BROWSER IL:COPYRIGHT ("Venue" 1991 2020 2023))

```

FUNCTION INDEX

CLOS-BROWSER:BROWSE-CLASS .....	3	CLOS-BROWSER::IN-SELECT-PACKAGE .....	16
CLOS-BROWSER::BROWSER-CONTAINS-P .....	4	CLOS-BROWSER::LYRIC-COMPLETE-SPECIALIZE .....	13
CLOS::CLASS-DIRECT-METHODS .....	13	CLOS-BROWSER::MAKE-METHOD-MENU-ITEMS .....	9
CLOS-BROWSER::CLASSES-IN-PACKAGE .....	16	CLOS-BROWSER::MAKE-MULTI-METHOD-SUB-MENU .....	10
CLOS-BROWSER::CLOS-BROWSER-CLOSE-FN .....	4	CLOS-BROWSER::MAKE-NODES .....	4
CLOS-BROWSER::COLLECT-FAMILY .....	4	CLOS-BROWSER::MAKE-TOP-LEVEL-METHOD-MENU-ITEMS .....	9
CLOS-BROWSER::COMPLETE-ADD-METHOD .....	12	CLOS-BROWSER::REPLACE-SPECIALIZERS .....	16
CLOS-BROWSER::COMPLETE-SPECIALIZE .....	12	CLOS-BROWSER::THIS-CLASS-NODE-P .....	13
CLOS-BROWSER::EDIT .....	9		

METHOD INDEX

(CLOS-BROWSER::ADD-ROOT (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(CLOS-BROWSER::ADD-ROOTS (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(WEB:BOX-NODE (CLOS-BROWSER:CLOS-BROWSER T)) .....	6
(WEB:BROWSE (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(CLOS-BROWSER::CLEAR-METHOD-MENU-CACHES (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(WEB:ICON-TITLE (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(WEB:INITIALIZE-EDITOR (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(CLOS-BROWSER::NEW-ITEM (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(WEB:RECOMPUTE (CLOS-BROWSER:CLOS-BROWSER)) .....	6
(CLOS-BROWSER::REAL-ADD-ROOT (CLOS-BROWSER:CLOS-BROWSER T)) .....	7
(WEB:SHAPE-TO-HOLD (CLOS-BROWSER:CLOS-BROWSER)) .....	7
(CLOS-BROWSER::SUBCLASSES-OF (T)) .....	7
(CLOS-BROWSER::CONTAINS-P (T CLOS-BROWSER:CLOS-BROWSER)) .....	7
(CLOS-BROWSER::OBJECT-NAME (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	8
(CLOS-BROWSER::OVERRIDE (CLOS-BROWSER::CLOS-BROWSER-NODE T)) .....	8
(CLOS-BROWSER::CACHE (T CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	8
(CLOS-BROWSER::UNCACHE (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	8
(CLOS-BROWSER:ADD-BROWSER-METHOD (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	10
(CLOS-BROWSER::BROWSE-SUBS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	10
(CLOS-BROWSER:EDIT-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	10
(CLOS-BROWSER::INSPECT-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	10
(CLOS-BROWSER::MENU-METHODS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	10
(CLOS-BROWSER::MAKE-WHENSELECTEDFN (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	11
(CLOS-BROWSER::DESCRIBE-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	12
(CLOS-BROWSER::DOCUMENTATION-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	12
(CLOS-BROWSER::PRINT-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	12
(CLOS-BROWSER::SPECIALIZE-CLASS (CLOS-BROWSER::CLOS-BROWSER-NODE)) .....	12
(CLOS::COMPUTE-INHERITED-METHODS (STANDARD-CLASS)) .....	13
(CLOS-BROWSER::SPECIALIZE (STANDARD-CLASS)) .....	14
(CLOS-BROWSER::SUBCLASSES-OF (STANDARD-CLASS)) .....	14
(CLOS-BROWSER::DELETE-METHOD (STANDARD-METHOD)) .....	14
(CLOS-BROWSER::COPY (STANDARD-METHOD STANDARD-CLASS)) .....	14
(WEB:MOVE (STANDARD-METHOD STANDARD-CLASS)) .....	14
(CLOS-BROWSER::PRINT-DEFINITION (STANDARD-METHOD)) .....	15
(CLOS-BROWSER:DESCRIBE-METHOD (CLOS::METHOD)) .....	15
(CLOS-BROWSER::RENAME (STANDARD-METHOD)) .....	15
(CLOS-BROWSER::UPDATE-CACHED-MENUES (STANDARD-METHOD)) .....	15
(CLOS-BROWSER::WHO-OWNS (STANDARD-METHOD)) .....	15
(ADD-METHOD :AFTER (STANDARD-GENERIC-FUNCTION STANDARD-METHOD)) .....	15

VARIABLE INDEX

CLOS-BROWSER::*METHOD-PROMPT-STRING* .....	8	CLOS-BROWSER::RELEASE-ID .....	16
CLOS-BROWSER:CLOS-ICON .....	3	CLOS-BROWSER::SYSTEM-DATE .....	16

CLASS INDEX

CLOS-BROWSER:CLOS-BROWSER .....	4	CLOS-BROWSER::CLOS-BROWSER-NODE ..	7	CLOS-BROWSER:CLOS-ICON .....	3
---------------------------------	---	------------------------------------	---	------------------------------	---

PROPERTY INDEX

IL:NEW-CLOS-BROWSER .....	3
---------------------------	---