
Subject: Making IDL Code Available: linked list modules
Posted by [Doug Larson](#) on Wed, 02 Sep 1998 07:00:00 GMT
[View Forum Message](#) <> [Reply to Message](#)

Here are some modules for linked lists. They are posted "as-is" to spur others to write a better linked list library.

Cheers,
Doug, PiledHigher and Deeper

--
Douglas J. Larson e-mail: djl@loki.srl.caltech.edu
Space Radiation Lab
California Institute of Technology
Mail Code: 220-47
Pasadena, CA 91125

```
. *****
;
;+
; Setup_llist.pro
;
; PURPOSE:
;   Setup a new node of a generic linked list.
;
; CATEGORY:
;   Generic linked list generator.
;
; CALLING SEQUENCE:
; somenewnode = ptr_new(Setup_llist(bugmsg))
;
; KEYWORD PARAMETERS:
; bugmsg      - Debugging message activator (0-No messages, 1-verbose mode)
;
; COMMON BLOCKS:
; None
;
; OUTPUTS:
; Data structure
;
; MODIFICATION HISTORY:
; Created by: Douglas J. Larson, 18 August, 1998.
;-
. *****
FUNCTION Setup_llist, bugmsg

if ( bugmsg eq 1 ) then message, ' Entered', /INFORMATIONAL
```

```
lls = { nodePtr:PTR_NEW(), $ ; Points to the linked list information
      next:PTR_NEW() } ; Pointer to the next data vector
```

```
if ( bugmsg eq 1 ) then message,' Exited', /INFORMATIONAL
```

```
RETURN, lls
```

```
END
```

```
. *****
;
;+
; llist_insert.pro
;
; PURPOSE:
;   Setup a new node of a generic linked list.
;
; CATEGORY:
;   Generic linked list generator.
;
; CALLING SEQUENCE:
;
; KEYWORD PARAMETERS:
; bugmsg      - Debugging message activator (0-No messages, 1-verbose mode)
;
; COMMON BLOCKS:
; None
;
; OUTPUTS:
; Data structure
;
; MODIFICATION HISTORY:
; Created by: Douglas J. Larson, 18 August, 1998.
;-
. *****
```

```
FUNCTION llist_insert, bugmsg, startPtr, value
```

```
if ( bugmsg eq 1 ) then message,' Entered', /INFORMATIONAL
```

```
if NOT(PTR_VALID(startPtr)) then begin
```

```
  if ( bugmsg eq 1 ) then message,'startPtr is NULL', /INFORMATIONAL
```

```
  startPtr = PTR_NEW(Setup_llist(bugmsg))
```

```
  currentPtr = startPtr
```

```
endif else if (PTR_VALID(startPtr)) then begin
```

```
  if ( bugmsg eq 1 ) then message,'startPtr is Valid', /INFORMATIONAL
```

```
  currentPtr=startPtr
```

```
  while (PTR_VALID(currentPtr)) do begin
```

```
    previousPtr=currentPtr
```

```
    currentPtr=(*currentPtr).next
```

```

    endwhile
    (*previousPtr).next = PTR_NEW(Setup_llist(bugmsg))
    currentPtr=(*previousPtr).next
endif
(*currentPtr).nodePtr = value
(*currentPtr).next = PTR_NEW()

if(bugmsg eq 1 ) then begin
  if NOT(PTR_VALID(value)) then begin
    message,'value is NULL', /INFORMATIONAL
  endif else begin
    message,'value is Valid', /INFORMATIONAL
  endelse
  if(NOT(PTR_VALID(startPtr)) or NOT(PTR_VALID(currentPtr)))then begin
    print,'PTR_VALID(startPtr)=',PTR_VALID(startPtr)
    print,'PTR_VALID(nextPtr)=',PTR_VALID(nextPtr)
    print,'PTR_VALID(currentPtr)=',PTR_VALID(currentPtr)
  endif
endif

if ( bugmsg eq 1 ) then message,'Exited', /INFORMATIONAL

RETURN, currentPtr

```

END

```

; *****
;
;+
; PURPOSE:
; Return the pointer to the desired record in the linked list.
;
; CALLING SEQUENCE:
;
; EXAMPLE:
;
; REQUIRED ROUTINES:
;
; VARIABLES:
; bugmsg      - Debugging message activator (0-No messages, 1-verbose mode)
;
; MODIFICATION HISTORY:
;   Created: Douglas J. Larson, 05 August, 1998.
;
;
; -
; =====
=====

```

```
function llist_lookup, bugmsg, startPtr, key, criteria
```

```
if(bugmsg eq 1) then message,' Entered', /INFORMATIONAL
```

```

if NOT(PTR_VALID(startPtr)) then begin
  if ( bugmsg eq 1 ) then message,'startPtr is NULL', /INFORMATIONAL
  retval = PTR_NEW()
endif else if (PTR_VALID(startPtr)) then begin
  if ( bugmsg eq 1 ) then message,'startPtr is Valid', /INFORMATIONAL

; Create a pointer to the heap variable pointed at by _startPtr_.
currentPtr = startPtr

    uckey = STRUPCASE(key)

    tag_number = where(tag_names((*currentPtr).nodeptr)) eq uckey, count)
if(bugmsg eq 1) then begin
    print,'counter=',count,' uckey=',uckey,' tag_number=',tag_number
endif

done = 0
while (done eq 0) do begin
  if(bugmsg eq 1) then begin
text='Tag String Requested='+key
message, text, /INFORMATIONAL
help,criteria
;help,(*currentPtr).(tag_number[0])
  endif
  if(criteria eq (*currentPtr).nodeptr).(tag_number[0])) then begin
    retval = (*currentPtr).nodeptr
    done = 1
  endif else begin
    ; Move to the next link in the list
    currentPtr = (*currentPtr).next
    if(ptr_valid(currentPtr) eq 0) then begin
      retval = ptr_new()
      done = 0
    endif
  endelse
endwhile
endif

if(bugmsg eq 1) then message,' Exited', /INFORMATIONAL

RETURN, retval
END
; *****
;
;+
; llist_print.pro
;
; PURPOSE:

```

```

;   Print a specified node element of an entire generic linked list.
;
;
; CATEGORY:
;   Generic singly linked list.
;
;
; CALLING SEQUENCE:
;   llist_print, bugmsg, startPtr, fieldwanted
;
;
; KEYWORD PARAMETERS:
;
;
; COMMON BLOCKS:
;   None
;
;
; OUTPUTS:
;   Data structure
;
;
; MODIFICATION HISTORY:
;   Created by: Douglas J. Larson, 22 August, 1998.
;-
; =====
=====
FUNCTION llist_print, bugmsg, startPtr, fieldwanted

if ( bugmsg eq 1 ) then message, ' Entered', /INFORMATIONAL

retval = 1
if NOT(PTR_VALID(startPtr)) then begin
    if ( bugmsg eq 1 ) then message, 'startPtr is NULL', /INFORMATIONAL
    retval = 0
endif else if (PTR_VALID(startPtr)) then begin
    ; Create a second pointer to the heap variable pointed at by _startPtr_.
    currentPtr = startPtr

    ; IDL likes all structure tags in uppercase.
    fieldwanted = strupcase(fieldwanted)

    tag_number = where(tag_names((*currentPtr).nodeptr) eq fieldwanted, count)

    if(count eq 0)then begin
        message, 'Tag is NOT in structure, check the code!'
        retval = 0
    endif else begin
        ; Traverse the linked list and print the list element information.
        while PTR_VALID(currentPtr) do begin
            print, currentPtr, ', named ', $
                (*currentPtr).nodeptr.(tag_number[0]), $
                ', points to: ', (*currentPtr).next
            currentPtr = (*currentPtr).next
        endwhile
    endif
endfunction

```

```
    endwhile  
  endelse  
  ; PTR_FREE,currentPtr  
endif
```

```
if ( bugmsg eq 1 ) then message,'Exited', /INFORMATIONAL
```

```
return, retval  
end
```

File Attachments

1) [l1ist.txt](#), downloaded 87 times
