Subject: Re: Search routines
Posted by Martin Schultz on Mon, 21 Sep 1998 07:00:00 GMT
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Kenneth P. Bowman wrote:
>

>> Kenneth P. Bowman wrote:
>>> IDL has a pretty good SORT routine, but no SEARCH routine [...]

Well, how about the one attached? I tested it with a 10000 element
array, and it is in fact about a factor of ten faster than MIN or WHERE.

Enjoy,
Martin.

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```
;------------------------------------------------------------ --
;+
; NAME:
;       SEARCH (function)
;
; PURPOSE:
;       Perform a binary search for the data point closest
;       to a given value. Data must be sorted.
;
; CATEGORY:
;       Math
;
; CALLING SEQUENCE:
;       index = SEARCH( DATA, VALUE )
;
; INPUTS:
;       DATA -> a sorted data vector
;
;       VALUE -> the value to look for
```

```
;
; KEYWORD PARAMETERS:
;       none.
;
; OUTPUTS:
;       The function returns the index of the nearest data
;       point.
;
; SUBROUTINES:
;
; REQUIREMENTS:
;
; NOTES:
;       This routine is much faster than WHERE or MIN for
;       large arrays. It was written in response to a newsgroup
;       request by K.P. Bowman.
;
; EXAMPLE:
;       test = findgen(10000)
;       print,search(test,532.3)
;       ; prints 532
;
; MODIFICATION HISTORY:
;       mgs, 21 Sep 1998: VERSION 1.00
;
;-
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; please contact the author to arrange payment.
; Bugs and comments should be directed to mgs@io.harvard.edu
; with subject "IDL routine search"
 ;--------------------------------------------------------- --


function search,data,value


    ; search first occurence of value in data set
    ; data must be sorted

    ; simple error checking on data and value
    if (n_elements(value) eq 0) then begin
       message,'Must supply sorted data array and value),/CONT
       return
```

```
    endif

    ndat = n_elements(data)

    try = fix(0.5*ndat)
    step = 0.5*try

    ; find index of nearest points
    while (step gt 1) do begin
       if (data[try] gt value) then $
          try = try-step $
       else   $
          try = try+step
       step = fix(0.5*(step+1))
    endwhile

    ; now get the data point closest to value
    ; can only be one out of three (try-1, try, try+1)
    dummy = min( abs(value-data[try-1:try+1]), location )

    return,try+location-1

end
```

File Attachments

1) search.pro, downloaded 170 times