
Subject: Not where

Posted by [bowman](#) on Mon, 07 Feb 2000 08:00:00 GMT

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I often find myself using WHERE to divide an array into two parts. I do one operation on the first part and a different operation on the second part.

It would be nice to have an auxiliary array containing all the indices that are *not* returned by WHERE in i. For example, it would be nice to do

```
a = FLTARR(...)
i = WHERE((a...), count, NOT_WHERE = j, NOT_COUNT = not_count)
IF (count GT 0L) THEN a[i] = ...
IF (not_count GT 0L) THEN a[j] = ...
```

Lacking the above changes to WHERE, can anyone suggest a fast and easy way to get $j = \text{NOT}(i)$?

Thanks, Ken

--

Dr. Kenneth P. Bowman, Professor
Department of Meteorology
Texas A&M University
College Station, TX 77843-3150

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409-862-4466 fax
bowmanATcsrp.tamu.edu
Replace AT with @

Subject: Re: Not where

Posted by [bowman](#) on Mon, 07 Feb 2000 08:00:00 GMT

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In article <bowman-0702000905130001@bowman.tamu.edu>, bowman@null.edu (Kenneth P. Bowman) wrote:

> It would be nice to have an auxiliary array containing all the indices
> that are *not* returned by WHERE in i.

Thanks for all the replies. Rather than appear to favor one, I decided to reply to my own posting. ;-)

The short answer seems to be no, there is no fast and easy way, although I tend to favor Liam's approach as being most similar to the existing WHERE function.

On another subject, I have been browsing through the "What's New in IDL 5.3" volume (thanks for earlier help from this group) and have discovered several improvements that have been proposed in this group (at least I thought they were good ideas!), although they are not necessarily easy to find.

The TOTAL function now includes a CUMULATIVE keyword. This makes it easy to convert histograms into cumulative histograms (among other things).

Speaking of not easy to find ;-), the new bisection search function is called VALUE_LOCATE. I do like the way it is implemented, though.`

Ken

Subject: Re: Not where
Posted by [Martin Schultz](#) on Mon, 07 Feb 2000 08:00:00 GMT
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Alex Schuster wrote:

>
> David Fanning wrote:
>
>> Kenneth P. Bowman (bowman@null.edu) writes:
>>
>>> I often find myself using WHERE to divide an array into two parts. I do
>>> one operation on the first part and a different operation on the second
>>> part.
>>>
>>> It would be nice to have an auxiliary array containing all the indices
>>> that are *not* returned by WHERE in i. [...]
>
> Easy, yes, maybe not too fast, and not very elegant. Martin Schulz wrote
> (and probably posted) the routine INV_INDEX, which I attached.

I'm listening ;-)

> [...]
> This would add 1 to a[i] and subtract 5 from a[NOT(i)], for example. But
> I admit that
> j = inv_index(i)
> a[i] = a[i] + 1
> a[j] = a[j] - 5
> looks better. (Not cooler, but better.)

It might not work, though ;-(

1. You *must* supply the second parameter (totaln), e.g. as in


```

; NOTES:
;   The function returns -1 if one of the following errors occurs:
;   - invalid number of arguments
;   - index variable is undefined
;   - totaln is less than n_elements(index)
;   - totaln less or equal 1, i.e. no associated data
;   The last error does not produce an error message, since this
;   feature was found to be very useful (in EXPLORE, the widget based
;   interactive data explorer)
;
; EXAMPLE:
;   data = findgen(50)
;   index = where(data ge 25)
;   invers = inv_index(index,n_elements(data))
;   print,invers
;
;   IDL prints numbers 0 through 24
;
; MODIFICATION HISTORY:
;   mgs, 10 May 1997: VERSION 1.00
;   mgs, 18 Aug 1997: - added template and check if n_elements(index) eq 0
;   mgs, 05 Apr 1999: - bug fix: needed to make sure result is type long
;
;--
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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 inv_index"
;-----

```

```

function inv_index,index,totaln

newindex = -1L   ; default: nothing left

; check for errors:
if (N_Params() ne 2) then begin
  print,'INV_INDEX: wrong number of arguments'
  return,newindex
endif
if (n_elements(index) eq 0) then begin
  print,'INV_INDEX: no valid index passed'
  return,newindex

```

```

endif
if (totaln lt n_elements(index)) then begin
    print,'INV_INDEX: totaln lt n_elements(index)'
    return,newindex
endif
if (totaln le 1) then return,newindex ; no data there

; and handle the two situations:
if (max(index) lt 0) then begin ; no valid index passed
    newindex = lindgen(totaln) ; create an integer array
    return,newindex ; with totaln elements
endif

; else a valid indexarray was passed and we can construct the inverse
newindex = lindgen(totaln)
newindex(index) = -1
i = where(newindex ge 0,count)
if (count gt 0) then newindex = newindex(i) $
else newindex = -1L

return, newindex
end

```

File Attachments

1) [inv_index.pro](#), downloaded 145 times

Subject: Re: Not where

Posted by [John-David T. Smith](#) on Mon, 07 Feb 2000 08:00:00 GMT

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Alex Schuster wrote:

>

> David Fanning wrote:

>

>> Kenneth P. Bowman (bowman@null.edu) writes:

>>

>>> I often find myself using WHERE to divide an array into two parts. I do

>>> one operation on the first part and a different operation on the second

>>> part.

>>>

>>> It would be nice to have an auxiliary array containing all the indices

>>> that are *not* returned by WHERE in i. For example, it would be nice to

>>> do

>>>

>>> a = FLTARR(...)

>>> i = WHERE((a...), count, NOT_WHERE = j, NOT_COUNT = not_count)

>>> IF (count GT 0L) THEN a[i] = ...

```
>>> IF (not_count GT 0L) THEN a[j] = ...
>>>
>>> Lacking the above changes to WHERE, can anyone suggest a fast and easy
>>> way to get j=NOT(i) ?
>
> i = where( a gt something )
> j = where( a le something )
>
> Easy, yes, maybe not too fast, and not very elegant. Martin Schulz wrote
> (and probably posted) the routine INV_INDEX, which I attached.
>
>> Now *here* is a place where Alex's matrix operations will
>> really pay off!
>>
>> I'll leave it to Alex to handle this question. :-)
>
> Hmm, now here I would rather use INV_INDEX instead...
>
> mask = where( a gt something)
> a = (a+1) * mask + (a-5) * (1B-mask)
>
```

Did you mean:

```
mask=a gt something
```

JD

--

```
J.D. Smith          |*|   WORK: (607) 255-5842
Cornell University Dept. of Astronomy |*|   (607) 255-6263
304 Space Sciences Bldg.      |*|   FAX: (607) 255-5875
Ithaca, NY 14853           |*|
```

Subject: Re: Not where

Posted by [Craig Markwardt](#) on Mon, 07 Feb 2000 08:00:00 GMT

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bowman@null.edu (Kenneth P. Bowman) writes:

```
> I often find myself using WHERE to divide an array into two parts. I do
> one operation on the first part and a different operation on the second
> part.
>
> It would be nice to have an auxiliary array containing all the indices
> that are *not* returned by WHERE in i. For example, it would be nice to
> do
> ...
```

I think I've asked for this before on this list, and I agree with you wholeheartedly. I don't believe there's anyway to simulate the desired feature in IDL without doing another operation.

The matrix approach doesn't always seem to be appropriate. (For example, working on very large arrays, one wants to avoid as many computations as possible. The matrix approach actually *compounds* the number of computations).

Craig

--

Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response

Subject: Re: Not where
Posted by [Alex Schuster](#) on Mon, 07 Feb 2000 08:00:00 GMT
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David Fanning wrote:

```
> Kenneth P. Bowman (bowman@null.edu) writes:  
>  
>> I often find myself using WHERE to divide an array into two parts. I do  
>> one operation on the first part and a different operation on the second  
>> part.  
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>> that are *not* returned by WHERE in i. For example, it would be nice to  
>> do  
>>  
>> a = FLTARR(...)  
>> i = WHERE((a...), count, NOT_WHERE = j, NOT_COUNT = not_count)  
>> IF (count GT 0L) THEN a[i] = ...  
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>> way to get j=NOT(i) ?
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```
i = where( a gt something )  
j = where( a le something )
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Easy, yes, maybe not too fast, and not very elegant. Martin Schulz wrote (and probably posted) the routine INV_INDEX, which I attached.

> Now *here* is a place where Alex's matrix operations will
> really pay off!
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> I'll leave it to Alex to handle this question. :-)

Hmm, now here I would rather use INV_INDEX instead...

```
mask = where( a gt something)
a = (a+1) * mask + (a-5) * (1B-mask)
```

This would add 1 to a[i] and subtract 5 from a[NOT(i)], for example. But I admit that

```
j = inv_index( i )
a[i] = a[i] + 1
a[j] = a[j] - 5
```

looks better. (Not cooler, but better.)

Alex

--

Alex Schuster Wonko@weird.cologne.de PGP Key available
 alex@pet.mpin-koeln.mpg.de

```
;----- --
;+
; NAME:
;   INV_INDEX
;
; PURPOSE:
;   find the indices that do NOT match a WHERE condition
;
; CATEGORY:
;   array index handling
;
; CALLING SEQUENCE:
;   RESULT = INV_INDEX(INDEX,TOTALN)
;
; INPUTS:
;   INDEX : an index array, e.g. previously generated by a
;           WHERE command (may be -1)
;   TOTALN : the number of elements in the reference data
;           set, i.e. totaln = n_elements(index)+n_elements(result)
;
; KEYWORD PARAMETERS:
;
; OUTPUTS:
;   an integer array with all indices that were NOT in index
;   or -1 if index was complete
```

```

;
; SUBROUTINES:
;
; REQUIREMENTS:
;
; NOTES:
;   The function returns -1 if one of the following errors occurs:
;   - invalid number of arguments
;   - index variable is undefined
;   - totaln is less than n_elements(index)
;   - totaln less or equal 1, i.e. no associated data
;   The last error does not produce an error message, since this
;   feature was found to be very useful (in EXPLORE, the widget based
;   interactive data explorer)
;
; EXAMPLE:
;   data = findgen(50)
;   index = where(data ge 25)
;   invers = inv_index(index,n_elements(data))
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;   IDL prints numbers 0 through 24
;
; MODIFICATION HISTORY:
;   mgs, 10 May 1997: VERSION 1.00
;   mgs, 18 Aug 1997: added template and check if n_elements(index) eq 0
;
;-
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; with subject "IDL routine inv_index"
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```

```

function inv_index,index,totaln

newindex = -1 ; default: nothing left

; check for errors:
if (N_Params() ne 2) then begin
  print,'INV_INDEX: wrong number of arguments'
  return,newindex

```

```

endif
if (n_elements(index) eq 0) then begin
    print,'INV_INDEX: no valid index passed'
    return,newindex
endif
if (total lt n_elements(index)) then begin
    print,'INV_INDEX: total lt n_elements(index)'
    return,newindex
endif
if (total le 1) then return,newindex ; no data there

; and handle the two situations:
if (max(index) lt 0) then begin ; no valid index passed
    newindex = indgen(totaln) ; create an integer array
    return,newindex ; with totaln elements
endif

; else a valid indexarray was passed and we can construct the inverse
newindex = indgen(totaln)
newindex(index) = -1
i = where(newindex ge 0,count)
if (count gt 0) then newindex = newindex(i) $
else newindex = -1

return, newindex
end

```

File Attachments

1) [inv_index.pro](#), downloaded 127 times

Subject: Re: Not where

Posted by [Alex Schuster](#) on Tue, 08 Feb 2000 08:00:00 GMT

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"J.D. Smith" wrote:

> Alex Schuster wrote:

```

>> mask = where( a gt something)
>> a = (a+1) * mask + (a-5) * (1B-mask)
>
> Did you mean:
>
> mask=a gt something

```

Um. Well. Yes.

Alex

--

Alex Schuster Wonko@weird.cologne.de
alex@pet.mpin-koeln.mpg.de

PGP Key available

Subject: Re: Not where

Posted by [Paul Krummel](#) on Mon, 21 Feb 2000 08:00:00 GMT

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Sorry about that, upgraded my news reader and the default is to uuencode attachments! Have now set it to not encode plain text. Thanks for pointing it out.

Cheers Paul

"Mark Fardal" <fardal@weka.astro.umass.edu> wrote in message
news:7vg0uqz363.fsf@weka.phast.umass.edu...

> "Paul Krummel" <paul.krummel@dar.csiro.au> writes:

<snip>

>> begin 666 sets.pro

>> M.RL-"CL@3D%-13H-"CL)4T544PT*.PT*.R!3970@;W!E<F%T;W)S+B @56YI

>> M;VXL(\$EN=&5R<V5C=&EO;BP@86YD(\$1I9F9E<F5N8V4@*&DN92X@ <F5T=7)N

> etc...

>

>

> Looks very useful. But what exactly is the point in uuencoding

> ascii text? :->

>

> thanks,

> Mark Fardal

> UMass

>
