Subject: Re: array transpose
Posted by Christian Soeller on Sun, 20 Apr 1997 07:00:00 GMT
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Gary Fu <gfu@shark.gsfc.nasa.gov> writes:

> Is there a simple way to transpose the array(x,y,z) to array(y,x,z) ?

RTFM -> transpose function

Christian

Subject: Re: array transpose
Posted by brian.jackel on Mon, 21 Apr 1997 07:00:00 GMT
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In article <5jg445$1mv@danberg.llnl.gov> dan@danberg.llnl.gov (Dan Bergmann) writes:

> Gary Fu <gfu@shark.gsfc.nasa.gov> writes:
> |> Is there a simple way to transpose the array(x,y,z) to array(y,x,z) ?

> Is there something better than

> for i=0,(size(array))(3)-1 do array(*,*,i) = transpose(array(*,*,i))
> array = reform(array,(size(array))(2),(size(array))(1),(size(array)) (3))

In the IDL 4.0 and later (and possibly earlier) documentation
---
Calling Sequence Result = TRANSPOSE(Array [, P])

Arguments

Array The array to be transposed.

P A vector specifying how the dimensions of Array will be permuted. The elements of P correspond to the dimensions of Array; the ith dimension of the output array is dimension P[i] of the input array. Each element of the vector P must be unique. Dimensions start at zero and can not be repeated.

If P is not present, the order of the indices of Array is reversed.
---

So result= TRANSPOSE( array, [1,0,2] ) should do it.

Subject: Re: array transpose
Posted by Christian Soeller on Mon, 21 Apr 1997 07:00:00 GMT
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Gary Fu <gfu@shark.gsfc.nasa.gov> writes:

>>
>> RTFM -> transpose function
>>
>> Christian
>
> The TRANSPOSE function will transpose to array(Z,Y,X), not array(Y,X,Z).

And what about transpose(array,[1,0,2]) ?
As I said, it's in the manual; one obviously has to know how to read it ;).

Christian

---

Subject: Re: array transpose
Posted by William Clodius on Mon, 21 Apr 1997 07:00:00 GMT
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David Fanning wrote:
>
> Christian Soeller <csoelle@sghms.ac.uk> writes:
>
>> Gary Fu <gfu@shark.gsfc.nasa.gov> writes:
>>
>>>>
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>
> What manual are you reading, Christian? Or perhaps more to the point,
> exactly HOW are you reading it!? I don't find this is *my* manual. :-(
>
> In any case, I can't get this to work. Can you perhaps tell us what
> software you are using and give us a simple example.
> <snip>

David:

Assuming you are using IDL and not PV-Wave (PV-Wave might differ on this point) the Reference Guide or the online documentation accessed by entering
> ?

both give for the TRANSPOSE function

"The TRANSPOSE function returns the transpose of Array. If an optional permutation vector is provided, the dimensions of Array are rearranged as well.

Calling Sequence
    Result = TRANSPOSE(Array [, P])

Arguments
...
    P
    A vector specifying how the dimensions of Array will be permuted. The elements of P correspond to the dimensions of Array; the ith dimension of the output array is dimension P(i) of the input array. Each element of the vector P must be unique. Dimensions start at zero and can not be repeated.
    If P is not present, the order of the indices of Array is reversed. ...

To see how a multi-dimensional transposition works, first create a three-dimensional array A:

A = INDGEN(2, 3, 4)

Take the transpose, reversing the order of the indices

B = TRANSPOSE(A)

Now re-order the dimensions of A, so that the second dimension becomes the first, the third becomes the second and the first becomes the third

C = TRANSPOSE(A, [1, 2, 0])"

--

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Los Alamos Nat. Lab., NIS-2  FAX: (505)-667-3815
PO Box 1663, MS-C323  Group office: (505)-667-5776
Los Alamos, NM 87545  Email: wclodius@lanl.gov

Subject: Re: array transpose
Posted by davidf on Mon, 21 Apr 1997 07:00:00 GMT
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Christian Soeller <csoelle@sghms.ac.uk> writes:

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software you are using and give us a simple example.

Thanks,

David

--
David Fanning, Ph.D.
IDL Training and Consulting
Completely Customized Courses--Guaranteed!
Phone: 970-221-0438 Fax: 970-221-4762
E-Mail: davidf@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com

Subject: Re: array transpose
Posted by dan on Mon, 21 Apr 1997 07:00:00 GMT
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In article <33595345.41C6@shark.gsfc.nasa.gov>, Gary Fu <gfu@shark.gsfc.nasa.gov> writes:
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|>
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|>
|> Thanks.
|>

|> Gary

Is there something better than

for i=0,(size(array))(3)-1 do array(*,*,i) = transpose(array(*,*,i))
array =  reform(array,(size(array))(2),(size(array))(1),(size(array)) (3))

--
**********
**  Dan Bergmann                    dbergmann@llnl.gov  **
**  Atmospheric Science Division       fax   (510) 423-4908  **
**  Lawrence Livermore National Lab    human (510) 423-6765  **

---

Subject: Re: array transpose
Posted by Gary Fu on Mon, 21 Apr 1997 07:00:00 GMT
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Christian Soeller wrote:
>
>  Gary Fu <gfu@shark.gsfc.nasa.gov> writes:
>
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Gary

---

Subject: Re: array transpose
Posted by Joseph M Zawodny on Tue, 22 Apr 1997 07:00:00 GMT
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This is a multi-part message in MIME format.

----------17601F1B6C24
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

David Fanning wrote:
>
>  Christian Soeller <csoelle@sghms.ac.uk> writes:
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>
>  In any case, I can't get this to work. Can you perhaps tell us what
>  software you are using and give us a simple example.
>
>  Thanks,
>
>  David

I hope that my attachment appears below.  I have written an
n-dimensional
transpose that, while not pretty or fast, does work.

 Have fun,

  JMZ

----------17601F1B6C24
Content-Type: text/plain; charset=us-ascii; name="reindex.pro"
Content-Transfer-Encoding: 7bit
Content-Disposition: inline; filename="reindex.pro"

```
;+
; Name: REINDEX
; Purpose: reorder the array subscripts, an n-dimensional transpose.
; Category: Array manipulation
; Calling sequence: out_arr=REINDEX(in_arr, sort)
;    or out_arr=REINDEX(/help)
;
; Example:   if IN_ARR = intarr(2,3,4,5) then
;  out_arr = reindex(in_arr,[2,4,3,1]) results in
;  out_arr becomming an array of dimension intarr(3,5,4,2)
; or reindex( f(x,y,z),[2,3,1]) becomes f(y,z,x)
; or reindex( f(x,y,z),[1,2,3]) does nothing
;
```

```
; Inputs:
; IN_ARR n-dimensional array  1 < n < 8
; SORT vector listing order of subscripts in result
; KEYWORDS"
; /HELP   Informs the user about this proceedure
;
; Output:
; OUT_ARR n-dimensional array  1 < n < 8 of same type as IN_ARR
;   with subscripts reordered
;
; Optional output parameters: None
; Common blocks:  None
; Side Effects:   None
; Restrictions:   Very large arrays may cause
;     excessive page faulting
; Routines used:  None
; Procedure:   Straight foreward.
; Modification history:
; V-1.0 First "Public release"
;  Oct 15, 1990 J.M. Zawodny, NASA LaRC
;-
function REINDEX,a,ind_order,help=help

 if keyword_set(help) then begin
print,' '
print,' Name: REINDEX'
print,' Purpose: reorder the array subscripts, an n-dimensional transpose.'
print,' Category: Array manipulation'
print,' Calling sequence: out_arr=REINDEX(in_arr, sort)
print,'    or out_arr=REINDEX(/help)
print,' '
print,' Example:   if IN_ARR = intarr(2,3,4,5) then'
print,'  out_arr = reindex(in_arr,[2,4,3,1]) results in'
print,'  out_arr becomming an array of dimension intarr(3,5,4,2)'
print,' or reindex( f(x,y,z),[2,3,1]) becomes f(y,z,x)'
print,' or reindex( f(x,y,z),[1,2,3]) does nothing
print,' '
print,' Inputs: '
print,' IN_ARR n-dimensional array  1 < n < 8'
print,' SORT vector listing order of subscripts in result'
print,' KEYWORDS"'
print,' /HELP   Informs the user about this proceedure'
print,' '
print,' Output: '
print,' OUT_ARR n-dimensional array  1 < n < 8 of same type as IN_ARR '
print,'   with subscripts reordered'
print,' '
  return,1
```

```
 endif

  ; Inquire about input array
 sa   = size(a)
  ; Check
 nind = n_elements(ind_order)

  ; Clone a singly dimensioned array
 if(nind eq 1) then return,a

  ; Incompatable arrays
 if(sa(0) ne nind) then begin
  print,'Number of subscripts does not match array'
  help,a,ind_order
  return,-1
 endif

  ; Make a destination array
 sb = sa([0,ind_order,nind+[1,2]])
 b  = make_array(size=sb)

  ; Compute some index arrays
 i  = lindgen(sa(nind+2))
 c  = lonarr(sa(nind+2),nind)
 e  = replicate(1L,nind+1)
 d  = 1L
 for k=0,nind-1 do begin
  c(0,k) = (i/d) mod sb(k+1)
  d      = d*sb(k+1)
  e(k+1) = e(k)*sa(k+1)
 endfor

  ; A place for the sorting array
 m  = lonarr(sa(nind+2))

  ; Calculate the indicies and fill output array
 b(0)=a( c # e( ind_order( indgen(nind) )-1 ) )

; All Done
return,b
end


----------17601F1B6C24--
```

---

## Subject: Re: array transpose

Posted by davidf on Tue, 22 Apr 1997 07:00:00 GMT
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Christian Soeller chides me when he writes:

> A guy like you will surely mostly use the online reference and not the
> old printed books. So if you check that it's all there.
>
> I am amazed that many people still seem to prefer the books. When I
> write IDL routines I spent at least half the time in the online help
> looking up proc/func refs ;).

Well, Chrisitan, I can only surmise that you must be younger than me. When I have the choice between squinting down the end of my nose and trying to make out those *very* small characters or looking at the big type in books, I always choose books.

But you shouldn't be so quick to chide. It might happen to you, too. In fact, if you are like me, sooner than you expected. :-)

Just say, somedays I don't feel like I'm getting any younger...

David

---
David Fanning, Ph.D.
Fanning Software Consulting
Customizable IDL Programming Courses
Phone: 970-221-0438  E-Mail: davidf@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com

---

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davidf@dfanning.com (David Fanning) writes:

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A guy like you will surely mostly use the online reference and not the old printed books. So if you check that it's all there.

I am amazed that many people still seem to prefer the books. When I write IDL routines I spent at least half the time in the online help looking up proc/func refs ;).