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 View Forum Message <> Reply to Message

Gary Fu <qfu@shark.qsfc.nasa.qov> 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 View Forum Message <> Reply to Message

```
David Fanning wrote:
```

```
> Christian Soeller <csoelle@sghms.ac.uk> writes:
>> Gary Fu <qfu@shark.gsfc.nasa.gov> writes:
>>
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       Christian
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>> As I said, it's in the manual; one obviously has to know how to read it;).
>
> 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

• • •

Ρ

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])"

--

William B. Clodius Phone: (505)-665-9370

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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Thanks,

David

--

David Fanning, Ph.D.

IDL Training and Consulting

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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 View Forum Message <> Reply to Message

In article <33595345.41C6@shark.gsfc.nasa.gov>, Gary Fu <gfu@shark.gsfc.nasa.gov> writes: |> Hi, |> |> Is there a simple way to transpose the array(x,y,z) to array(y,x,z)?

|> Thanks.

|>

1>

|> 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 View Forum Message <> Reply to Message Christian Soeller wrote: > 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 The TRANSPOSE function will transpose to array(Z,Y,X), not array(Y,X,Z). Gary Subject: Re: array transpose Posted by Joseph M Zawodny on Tue, 22 Apr 1997 07:00:00 GMT View Forum Message <> Reply to Message 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
```

```
; 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*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

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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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Posted by Christian Soeller on Tue, 22 Apr 1997 07:00:00 GMT

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davidf@dfanning.com (David Fanning) writes:

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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;).

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