Subject: Re: 3D-coordinates of index returned MAX()
Posted by David Fanning on Sun, 06 Apr 2003 20:03:23 GMT
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> I have problems determining the coordinates from the index returned by
> MAX(). The online help has an example for that in 2D, but I need a solution
> for 3D-space.
>
> What tells me this index? Is something like the pixelnumber in the whole
> 3D-array? How is this array referenced through the index?
>
> The code looks like this:
> nXCoord = nMaxIndex mod size_imgRef_x
> nYCoord = nMaxIndex / (size_imgRef_x * size_imgRef_z)
> nZCoord = nMaxIndex / (size_imgRef_x * size_imgRef_y)
>
> It does not work for me. Am I just to blind/stupid to see the solution or is
> there some difference between 2D and 3D.
>
> Best regards and thanks for your help in advance,

Your Y index is wrong. It should be:

nYCoord = (nMaxIndex/size/imgRef_x) MOD size_imgRef_y

Here is a reference:

http://www.dfanning.com/tips/where_to_2d.html

Cheers,

David

--
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Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: 3D-coordinates of index returned MAX()
Posted by Mark Hadfield on Sun, 06 Apr 2003 20:28:38 GMT
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"David Fanning" <david@dfanning.com> wrote in message
news:MPG.18fa35faf111256f989b36@news.frii.com...
> Here is a reference:
>
> http://www.dfanning.com/tips/where_to_2d.html

Noting that the wheretomulti routine referred to on that page...

http://www.dfanning.com/tip_examples/wheretomulti.pro

...handles only 2D and 3D arrays, I wrote a version to handle any array dimensionality. I called it MGH_INDN (heaven knows why). Source code is included below my sig and there is (or will be) a copy included in the Motley library @

http://www.dfanning.com/hadfield/README.html

--
Mark Hadfield "Ka puwaha te tai nei, Hoea tatou"
m.hadfield@niwa.co.nz
National Institute for Water and Atmospheric Research (NIWA)

--- mgh_indn.pro ---
```
;+
; NAME:
;   MGH_INDN
;
; PURPOSE:
;   Convert a 1-D array index (as returned, for example, by the
;   WHERE function) to an n-dimensional index
;
; CALLING SEQUENCE:
;   result = MGH_INDN(ind1, dim)
;
; POSITIONAL PARAMETERS:
;   ind1 (input, compulsory, integer, scalar)
;     1-D array index
;
;   dim (input, compulsory, integer, vector)
;     Dimensions of array for which n-dimensional index is required.
;
; RETURN VALUE:
;   The function returns an integer vector, with the same number of
;   elements as the dim argument, containing indices into the
;   multi-dimensional array.
;
 ;############################################################## ################
```

```
;
; This software is provided subject to the following conditions:
;
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;     accuracy of the software, the use to which the software may
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; 2.  NIWA is to be acknowledged as the original author of the
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;
 ;################################################################ ##################
;
; MODIFICATION HISTORY:
;   Mark Hadfield, 2003-02:
;     Written.
;-
function mgh_indn, ind1, dim

   compile_opt DEFINT32
   compile_opt STRICTARR

   if n_elements(ind1) ne 1 then $
        message, 'A single 1-D index is required'

   if n_elements(dim) eq 0 then $
        message, 'A list of dimensions is required'

   n_dim = n_elements(dim)

   result = lonarr(n_dim)

   n = ind1

   for i=0,n_dim-1 do begin

      result[i] = n mod dim[i]

      n = n / dim[i]

   endfor

   if n gt 0 then $
        message, 'There''s some left over!'

   return, result
```

end

Subject: Re: 3D-coordinates of index returned MAX()
Posted by marc schellens[1] on Mon, 07 Apr 2003 11:51:30 GMT
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I wote something similar to Mark, but here you convert all
indices at once. And instead of a list of dimensions, you just
call it with the array which was indexed by the 'where' function.
Hope it helps,
marc

```
;; NAME:
;; L_GetDim
;;
;; PURPOSE:
;; translates a one-dimensional index (like given by where() function)
;; into a multidimensional one (i.e. the array indices according to
;; the multidimensional array)
;;
;; PARAMETERS:
;; a   the array
;; ix  the one dimensional index (or array of indices)
;; if ix is omitted, the dimensions of a are returned
;;
;; KEYWORDS:
;; MINDIM  if set, only the number of dimensions of a is returned,
;;         else 8 dimensions (what is better in some degenerated
;;         cases, i.e the calling program can rely on that there is
;;         always a second(third...) dimension given)
;;
;; returns a 8 by n_elements(ix) array
;;
;; example:
;;IDL> a=intarr(23,24,27,33)
;;IDL> a[13,19,2,11]=1
;;IDL> ix=where(a)
;;IDL> print,l_getdim(a,ix)
;;          13          19           2          11           0
  0          0          0
;;IDL> print,l_getdim(a)
;;          23          24          27          33           1
  1          1          1
;;
;; MODIFICATION HISTORY:
```

```
;; Marc Schellens 01.2002



function L_GetDim,a,ix,MINDIM=minDim

sz=size(a)

if n_params() eq 1 then begin
    ;; maximum of eight dimensions in IDL
    if keyword_set(minDim) then return,size(a,/dim)
    r=lonarr(8)
    r[*]=1
    if sz[0] ge 1 then r[0:sz[0]-1]=sz[1:sz[0]]
    return,r
endif

nConv=n_elements(ix)

;; maximum of eight dimensions in IDL
r=lonarr(keyword_set(minDim)?sz[0]>1:8,nConv)

;; index 1
r[0,*]=ix mod sz[1]

;; index 2..n-1
sum=1L
for i=1,sz[0]-2 do begin
    sum=sum*sz[i]
    r[i,*]=(ix / sum) mod sz[i+1]
endfor

;; index n
if sz[0] ge 2 then begin
    i=sz[0]-1

    sum=sum*sz[i]
    r[i,*]=ix / sum
endif

return,r
end
```

Subject: Re: 3D-coordinates of index returned MAX()
Posted by Mark Hadfield on Mon, 07 Apr 2003 20:32:46 GMT
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"Marc Schellens" <m_schellens@hotmail.com> wrote in message
news:3E916642.1070904@hotmail.com...
> I wote something similar to Mark, but here you convert all
> indices at once.

Great, I'll steal that idea.

> And instead of a list of dimensions, you just
> call it with the array which was indexed by the 'where' function.

Yeah, I thought about that, but I figured there *might* be a situation where one wants to calculated n-dimensional indices without having (or wanting to create) an array with that dimensionality. ... I haven't actually encountered this situation however.

--

Mark Hadfield "Ka puwaha te tai nei, Hoea tatou"
m.hadfield@niwa.co.nz
National Institute for Water and Atmospheric Research (NIWA)

Subject: Re: 3D-coordinates of index returned MAX()
Posted by on Tue, 08 Apr 2003 16:40:50 GMT
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Hi David,

"David Fanning" <david@dfanning.com> wrote
| Your Y index is wrong. It should be:
|
| nYCoord = (nMaxIndex/size/imgRef_x) MOD size_imgRef_y
|
| Here is a reference:
|
| http://www.dfanning.com/tips/where_to_2d.html

Thanks alot, It's working perfectly!

Alex

_____

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