Subject: Array manipulation
Posted by majewski on Wed, 01 Nov 2000 05:21:21 GMT
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Hello
I was wondering whether any array minded person could suggest a way of using array indicies to chop up a large array into ordered windows.
I can't think of a way to do it with reform, translate (though i'm sure this is my limitation not a reform translate limitation)

---
ie given an array of 30*30 elements
return 100 3*3 elements
or 36 5*5
or...

in=

00 01 02 03 04 05..
30 31 32 33 34 35..
60 61 62 63 64 65..

out = blocks such as
00 01 02
30 31 32
60 61 62

each block is then processed to one representative number (ie mean or median....) and returned

---
What i've used so far is attached below (it does what i want, just slowly)

leon

```
FUNCTION QMean2, DATA, $
 WIDTH=WIDTH, $
 MINVAL=MINVAL, $
 MAXVAL=MAXVAL, $
 SILENT=SILENT

;+
;NAME:
; QMean2
;
```

```
;PURPOSE:
; Calculate the mean of an array, excluding values 0 and NaN.
;
;CATEGORY:
; Array Manipulation
; Statistics
;
;CALLING SEQUENCE:
; Result = QMean(DATA)
;
;ARGUMENTS:
; DATA
;  A 2-dimensional array to be averaged
;
;KEYWORDS:
; MAXVAL
;  If the data is above this value it is omitted.
; MINVAL
;  Only data greater than this value is included in the mean.
;  If this keyword is not set, it defaults to 0.
; WIDTH
;  The width of the averaging box. If this keyword is not set then
;  it defaults to a value of 4.
;
;OUTPUTS:
; An array holding the average of the input data.
;  This array is of size (Xdim/Width, Ydim/Width).
;
;SIDE EFFECTS;
; If the size of the array holding the data is not a multiple of the
;  Width of the filter, then the Array is truncated to a size that is a
;  Multiple of the Width - The program Outputs a warning if this is the
;  case.
;
;EXAMPLES:
; Result = QMean(findgen(20,20), Width = 5)
; Result = QMean(findgen(20,20), Width = 5)
; Result = QMean(findgen(20,20), Width = 15, MAXVAL = 210.3)
;
;MODICIFACTION HISTORY:
; Created, Leon Majewski, 3rd August 2000
;
;-

IF Size(MINVAL, /n_elements) EQ 0 THEN MINVAL = 0
IF Size(WIDTH, /n_elements) EQ 0 THEN WIDTH = [4,4]
IF Size(WIDTH, /n_elements) EQ 1 THEN WIDTH = [WIDTH,WIDTH]
IF NOT KEYWORD_SET(SILENT) THEN SILENT = 1 ELSE SILENT = 0
```

```
;start_time = SYSTIME(1)

 DATA_IN = DATA
 Size_Data = SIZE(DATA_IN)

 xdim = Size_Data[1]/Width[0]
 xdim_less1 = xdim-1
 ydim = Size_Data[2]/Width[1]
 ydim_less1 = ydim-1

 IF Size_Data[1] NE xdim*width[0] THEN BEGIN
  if silent then begin
   print, 'The x dimension is not a multiple of the specified WIDTH.'
   print, 'Reducing the size of the array from'
   help,  DATA_IN
  endif

  DATA_IN = DATA_IN[0:(xdim)*width[0]-1, *]

  if silent then help,  DATA_IN
 ENDIF

 IF Size_Data[2] NE ydim*width[1] THEN BEGIN
  if silent then begin
   print, 'The y dimension is not a multiple of the specified WIDTH.'
   print, 'Reducing the size of the array from'
   help,  DATA_IN
  endif

  DATA_IN = DATA_IN[*,0:(ydim)*width[1]-1]

  if silent then help,  DATA_IN
 ENDIF

 IF KEYWORD_SET(MAXVAL) THEN $
  IF MAXVAL GT MINVAL THEN $
   DATA_IN = DATA_IN*(DATA_IN lt MAXVAL)

 Size_Data = SIZE(DATA_IN)
 n_els = Size_Data[4]

 DATA_IN = REFORM(DATA_IN, Width[0], n_els/Width[0], /overwrite)
 DATA_IN = REFORM(DATA_IN, Width[0], xdim, Width[1], ydim, /overwrite)

 Average = FLTARR(xdim,ydim)

 FOR j = 0, ydim_less1 DO BEGIN
  FOR i = 0, xdim_less1 DO BEGIN
```

```
   data_sub = REFORM(DATA_IN[*,i,*,j])
   goodpos = WHERE(data_sub GT MINVAL AND $
      FINITE(data_sub) EQ 1, c_goodpos)

   IF c_goodpos NE 0 THEN BEGIN
    data_sub = data_sub[goodpos]
    Average[i,j] = TOTAL(data_sub)/N_ELEMENTS(data_sub)
   ENDIF ELSE Average[i,j]=0

  ENDFOR
 ENDFOR

; print, SYSTIME(1) - start_time, 's'

RETURN, Average
END
```

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