Subject: Re: Watersheds and Label_Region for 1d
Posted by Ben Tupper on Thu, 06 Jul 2000 07:00:00 GMT
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Hello,

I have made some progress. Well, I 've made some progress toward the Label_Region function for vectors.

I tried a number of tricks including using the REVERSE_INDICES keyword for HISTOGRAM.
In the end, I settled for the tried and true brute-force-and-ignorance approach. It's not dainty but seems
to work with all of the mocked-up data I could think of.

```
;---------SNIP-------
;+
; NAME:  LABEL_VECTOR
;
; PURPOSE: This function returns a labeled (blob-colored) vector
;  where each unique region bears a unique region number.
;  This function is analogous to the built in LABEL_REGION function for
IDL.
;
; CALLING SEQUENCE:
;  Result = LABEL_VECTOR(Vector, [BackGround])
;
; ARGUMENTS:
;  Vector  Set this value to a numeric vector (Byte,Integer, etc.)
;  BackGround  Set this argument equal to the background value
;    of the vector... that is, the value that separates the blobs.
;    If not provided, the default value of zero is used.
;
; KEYWORDS:
;
;  MAXLABEL Set this keyword to a named variable to retrieve the
; maximum label value.  (Saves a MAX(Result) later.)
;
; EXAMPLE:
;  Generate a dummy vector... then plot it with the colorings
;   superimposed.
;    IDL> v = indgen(20)
;    IDL> v = rebin(shift(v*5,5), 80,/sample)
;    IDL> f = Label_Vector(V)
;    IDL> plot, v
;    IDL> TEK_COLOR
;    IDL> plots, indgen(80), v, color=f, /data, psym = 6
;
```

```
; MODIFICATION HISTORY:
;   Written 6JULY2000, Ben Tupper
;   Bigelow Laboratoryu for Ocean Science
;   tupper@seadas.bigelow.org
;   pemaquidriver@tidewater.net
;-

;-------
; Label_Vector
;-------
FUNCTION Label_Vector, Vec, BackGround ,MaxLabel = MaxLabel

LabeledVec = Fix(Vec GT 0)
N = N_elements(Vec)
MaxLabel = 0

If N_Params() EQ 2 then Background = Background[0] Else Background = 0

A = Where(Labeledvec GT 0, Count)

If Count GT 0 Then Begin

 MaxLabel = 1


 For i = A[0] , N - 1L Do Begin

  If LabeledVec[i] GT 0 Then Begin

    LabeledVec[i] = MaxLabel

  EndIf Else Begin

    If i NE N-1L Then $
      If LabeledVec[i] NE LabeledVec[i+1L] Then $
        MaxLabel  = MaxLabel +1

  EndElse

 EndFor  ; i loop

EndIf ; Count GT 0

Return, LabeledVec

END
;--------SNIP-------
```

--
Ben Tupper

Bigelow Laboratory for Ocean Science
tupper@seadas.bigelow.org

pemaquidriver@tidewater.net

Subject: Re: Watersheds and Label_Region for 1d
Posted by Ben Tupper on Fri, 07 Jul 2000 07:00:00 GMT
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rshill@my-deja.com wrote:

>
>
> One cheap trick is to replicate the vector three times and do the
> label_region on the resulting 2-D array:
>
>   vec = [0,0,0,2,2,2,0,1,5,1,2,1,0,0,0,3,99,3,3]
>   arr = [0,vec,0] # [1,1,1]   ; Avoid edge effects.
>   lab2d = label_region(arr)
>   lab1d = (lab2d[*,1])[1:n_elements(vec)]
>
>

Smart and Cheap! Thanks!

Ben

--
Ben Tupper

Bigelow Laboratory for Ocean Science
tupper@seadas.bigelow.org

pemaquidriver@tidewater.net

Subject: Re: Watersheds and Label_Region for 1d
Posted by rshill on Fri, 07 Jul 2000 07:00:00 GMT
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My apologies to anyone who is seeing this message twice.

On Thu, 6 Jul 2000, Ben Tupper wrote:
> In order to do this I need to mimic the LABEL_REGION function on a
> vector. I can think of a number of
> ways of doing this... but they seem computationally expensive (lots of
> WHERE's and connectedness checking.)

One cheap trick is to replicate the vector three times and do the
label_region on the resulting 2-D array:

```
vec = [0,0,0,2,2,2,0,1,5,1,2,1,0,0,0,3,99,3,3]
arr = [0,vec,0] # [1,1,1]   ; Avoid edge effects.
lab2d = label_region(arr)
lab1d = (lab2d[*,1])[1:n_elements(vec)]
```

Another thing you can do if you just want the endpoints of the runs is
this:

```
nv = n_elements(vec)
flag = [0, vec NE 0, 0]     ; Avoid endpoint effects.
diff = flag[1:nv+1] - flag[0:nv]
run_start = where(diff EQ 1)
run_end = where(diff EQ -1) - 1
```

Footnote: Be careful with the type of the flag array, which
later determines the type of the diff array. Comparisons may depend
on variable type, because of signed vs. unsigned. In other words,
-1b (byte) is not equal to -1 (integer) because -1b is actually 255.

---Bob H.

Subject: Re: Watersheds and Label_Region for 1d
Posted by Ben Tupper on Fri, 07 Jul 2000 07:00:00 GMT
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Shame on me!

I posted unfinished code. Please find the corrected version below.

Ben

----snip

```
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; MODIFICATION HISTORY:
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;   tupper@seadas.bigelow.org
;   pemaquidriver@tidewater.net
;
;   7JUL2000 oops!,  Actually implement Background argument! BT
;-

;-------
; Label_Vector
;-------
FUNCTION Label_Vector, Vec, BackGround ,MaxLabel = MaxLabel

On_Error, 2
```

```
Sz = Size(Vec)
If Sz[0] NE 1 Then Begin
  Message,'First argument must be a 1d vector'
  Return, -1
EndIf

If N_Params() EQ 2 then Background = Background[0] Else Background = 0
LabeledVec = Fix(Vec NE BackGround)
N = Sz[3]
MaxLabel = 0

A = Where(Labeledvec GT 0, Count)

If Count GT 0 Then Begin

 MaxLabel = 1

 For i = A[0] , N - 1L Do Begin

  If LabeledVec[i] GT 0 Then Begin

    LabeledVec[i] = MaxLabel

  EndIf Else Begin

    If i NE N-1L Then $
      If LabeledVec[i] NE LabeledVec[i+1L] Then $
        MaxLabel  = MaxLabel +1

  EndElse

 EndFor  ; i loop

EndIf ; Count GT 0

Return, LabeledVec

END
```

----snip

--
Ben Tupper

Bigelow Laboratory for Ocean Science
tupper@seadas.bigelow.org

pemaquidriver@tidewater.net