Subject: Re: Shapefile 'parts' woes
Posted by David Fanning on Wed, 19 Mar 2008 12:33:46 GMT
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## Gaurav writes:

- > I have a shapefile with many polygons. Most of these polygons have
- > holes and hence these have multiple parts. I wish to create a new
- > shapefile by modifying points in some 'parts' of the polygons. How do
- > I acess the points of a particular 'part' of a polygon? I went through
- > the two examples: the one in help and the other in demo programs-
- > showing the globe, but could not deduce how to solve my problem.

You might be able to deduce how to access these parts, which I call "cuts" in DRAWSTATES, a program to try shapefiles:

http://www.dfanning.com/programs/drawstates.pro

- > Would anyone be kind enough to bail me out of the rut or point me to
- > some link where I might be shone upon with the divine light?

Don't look for divine light from me. I remember it as a confusing slog, with more perspiration than inspiration. What you see in that program is the sum total of my knowledge of shapefiles, if not more.

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming: http://www.dfanning.com/

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Shapefile 'parts' woes

Posted by Gaurav on Thu, 20 Mar 2008 06:38:45 GMT

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Dear Dr. Fanning,

I was able to find out the simple working of "cuts" after reading the Globe display program "d\_map.pro" from the selection of demo programs and your program too discusses as much. Maybe it is my shortcoming that I fail to implement it in my program but here is what I want:

The shapefiles that I have as input are those obtained by Raster to

Vector conversion program and have jagged edges. I want to smoothen the edges by replacing each of the points in the polygon by an average value of the previous point, the current point and the next point. In my simple and ideal shapefile in which each polygon had one single part. I could do so simply using the following code:

```
myshape=OBJ NEW('IDLffShape', 'G:\r2v\inputshp.shp')
mynewshape=OBJ_NEW('IDLffShape','G:\r2v\outshp.shp', /UPDATE,
ENTITY TYPE=5)
myshape->IDLffShape::GetProperty, N ENTITIES=num ent
FOR x=0, (num ent-1) DO BEGIN
   ent=myshape->IDLffShape::GetEntity(x)
   numVertices = n_elements((*ent.vertices)[0,*])
   newVertices = ptr_new(dblarr(2,numVertices))
 (*newVertices)[0,0] = (*ent.vertices)[0,0];The first vertex is
simply copied
 (*newVertices)[1,0] = (*ent.vertices)[1,0]
   for y = 1, numVertices-2 do begin
(*newVertices)[0,y] = ((*ent.vertices)[0,y-1] + (*ent.vertices)[0,y]
+ (*ent.vertices)$ [0,y+1])/3.0
(*newVertices)[1,y] = ((*ent.vertices)[1,y-1] + (*ent.vertices)[1,y]
+ (*ent.vertices)$ [1,y+1])/3.0
  endfor
       :The last vertex is the same as the first
 (*newVertices)[0,numVertices -1] = (*ent.vertices)[0,0]
 (*newVertices)[1,numVertices -1] = (*ent.vertices)[1,0]
Endfor ; for each of the polygon entities
```

But in any ordinary shapefile many of the entities consist of many parts and I am having trouble smoothening out each of these parts separately. I am very much at sea as to how to go about it. What I tried is following, perhaps you could point out where I am going wrong:

```
FOR x=0, (num ent-1) DO BEGIN
   ent=myshape->IDLffShape::GetEntity(x)
   numVertices = n_elements((*ent.vertices)[0,*])
   newVertices = ptr_new(dblarr(2,numVertices)); for the vertices
in old and new polygons are same in number
   if(ptr_valid(ent.parts) ne 0)then begin
   cuts = [*ent.parts, ent.n_vertices]
     for j=0, ent.n_parts-1 do begin
      ;the first vertex of each cut is copied as it is:
 ((*newVertices)[0,cuts[j]]) = ((*ent.vertices)[0,cuts[j]])
  ((*newVertices)[1,cuts[i]]) = ((*ent.vertices)[1,cuts[i]])
```

```
;find the number of remaining vertices in each cut leaving the first
and the last
 numb = n\_elements((*ent.Vertices)[0,cuts[i]+1:cuts[i+1]-2])
 for y = 1, numb-2 do begin
  ;calculating the average values of the vertex of the "cuts"
  ((*newVertices)[0,cuts[j]+y]) = (((*ent.vertices)[0,cuts[j]+y-1])
+ ((*ent.vertices)[0,cuts[i]+y]) + ((*ent.vertices)[0,cuts[i]+y+1]))/3
  ((*newVertices)[1,cuts[j]+y]) = (((*ent.vertices)[1,cuts[j]+y-1])
+ ((*ent.vertices)[1,cuts[i]+y]) + ((*ent.vertices)[1,cuts[i]+y+1]))/3
       Endfor; for the vertices
 ;the value of last vertex of each "cut" is set to be same as the
first vertex
  ((*newVertices)[0,cuts[j+1]-1]) = ((*ent.vertices)[0,cuts[j]])
  ((*newVertices)[1,cuts[j+1]-1]) = ((*ent.vertices)[1,cuts[j]])
endfor:for the "cuts"
 endif
endfor: for the entities
Regards
Gaurav
```

Subject: Re: Shapefile 'parts' woes
Posted by David Fanning on Thu, 20 Mar 2008 14:01:13 GMT
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## Gaurav writes:

- > But in any ordinary shapefile many of the entities consist of many
- > parts and I am having trouble smoothening out each of these parts
- > separately. I am very much at sea as to how to go about it. What I
- > tried is following, perhaps you could point out where I am going
- > wrong:

Uuhhg! Wandering through a sea of shapefile code is \*not\* on my list of fun things to do today. :-)

I do have a suggestion, however. I have a program named ARCSAMPLE that resamples a closed curve, such as your polygons. One of the effects it has is to smooth the curve. If you can read the polygon and apply ArcSample to it and put it back, it may be just what you are looking for. But the pointer code is just too tedious for me today, sorry.

http://www.dfanning.com/programs/arcsample.pro

Cheers.

## David

--

David Fanning, Ph.D.
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Coyote's Guide to IDL Programming: http://www.dfanning.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Shapefile 'parts' woes
Posted by cgpadwick on Thu, 27 Mar 2008 13:38:45 GMT
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Here's a routine that might help you understand how to do what you want. IDLffShape has a nasty gotcha that can trip people up: it only defines the parts pointer if the polygon contains multiple contours. So I usually handle that by checking the n\_parts and if it is zero then I set parts = [0]. That way I don't have to have a bunch of nasty if (nparts eq 0) logic in my code.

```
pro printPoly, verts, partsPtr
 nParts = N Elements(partsPtr)
 nVerts = N Elements(verts[0,*])
 for ndx=0L, nParts-1L do begin
  sldx = partsPtr[ndx]
  eldx = ( (ndx+1) gt nParts-1L) ? nVerts - 1L : partsPtr[ndx+1L]-1L
  Print. '=========
  Print, 'NDX: ', String(StrTrim(ndx, 2))
  Print, 'VERTICES: ', verts[*,sldx:eldx]
 endfor
end
pro testShape
 filename = Dialog_Pickfile(TITLE='Pick the shapefile...')
 oShape = Obj_New('IDLffShape', filename)
 oShape->GetProperty, N ENTITIES=nEnt
 window, 1
 for ndx=0L, nEnt-1L do begin
```

```
ent = oShape->GetEntity(ndx)
  verts = *ent.vertices
  parts = *ent.parts
  nParts = ent.n_parts
  if (nParts eq 0) then parts = [0]
  printPoly, verts, parts
  oShape->DestroyEntity, ent
 endfor
 Obj_Destroy, oShape
end
```

Subject: Re: Shapefile 'parts' woes Posted by Gauray on Fri, 28 Mar 2008 08:16:35 GMT View Forum Message <> Reply to Message

Thanks indeed for the attention. Creation of shapefiles is a very nifty utility that IDL provides and a fair understanding of it saves a lot of work. I was able to tide over my current problem by trial and error. Apparently, I was not calculating the number of points that I needed to modify (stored in the variable 'numb'), properly.

The output of the code is very proper and it beautifully removes the jagged, staircase effect in the vector files that are very common when one converts a raster image to vector.

Thanks indeed. Gaurav