Subject: Polygon filling oddities
Posted by Mark Hadfield on Thu, 04 Oct 2001 00:47:30 GMT
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Hello all

I have been experimenting with different methods of generating images representing filled polygons. (My motivation comes from attempts at drawing filled coastlines on various devices.) I have found some oddities when using the POLYFILLV routine and the IDLanROI object. Before I take this issue to RSI tech support I thought I'd show it to the group and ask whether what I am doing makes sense.

The procedure below (and attached) illustrates the problem. It displays a 500 x 500 image with a centred circle of radius 300 using several methods, controlled by the option argument:

- 0 Call POLYFILL directly to window
- 1 Use POLYFILLV to create an image then display image
- 2 Use POLYFILL to create the image in a Z buffer then display image
- 3 Create an IDLanROI object and use its ComputeMask method to create an image, then display image.

These all seem to work and to give identical results, except perhaps for some minor differences around the edge of the polygon.

The routine also accepts a SHIFT keyword that lets the caller shift the circle around on the image plane. With options 0 and 2 this works exactly as expected: as SHIFT is increased the circle moves to the edge of the window and eventually disappears. But with options 1 and 3 the results are unexpected: as SHIFT is made more negative the circle vanishes abruptly when it passes a threshold.

For example "mgh_test_polyfill, 1, -143" (using POLYFILLV) produces a circle with its edge not quite touching the lower left corner of the image and "mgh_test_polyfill, 1, -144" produces a blank image. Similarly "mgh_test_polyfill, 3, -101" (using IDLanROI::ComputeMask) produces a circle with its edges touching the bottom and left sides of the image and "mgh_test_polyfill, 3, -101" produces a blank image.

I guess POLYFILLV and IDLanROI are intended for dealing with regions of interest on images and it is anticipated that the vertices of the ROI will be in the positive quarter-plane. But I don't see any reason why they shouldn't be able to work with negative vertex coordinates.

So is what I've found a bug or a feature? Can others reproduce my results? (I've been using IDL 5.4.)

```
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----- mgh_test_polyfill ------
; Testing various methods of polygon filling
pro mgh test polyfill, option, SHIFT=shift
  compile opt IDL2
  if n_{elements} (option) eq 0 then option = 0
  if n_elements(shift) eq 0 then shift = 0
  if n_elements(shift) eq 1 then shift = [shift,shift]
  ; Create a window dimensioned [500,500]
  window, XSIZE=500, YSIZE=500
  ; Set up coordinates defining a circle, radius 150, centred at 250
  n_vert = 50
  angle = 2.*!pi*findgen(n_vert+1)/float(n_vert)
  x = 250 + 150*sin(angle)
  y = 250 + 150*cos(angle)
  ; Shift the circle
  x = x + shift[0]
  y = y + shift[1]
  ; Generate & display and image using different methods depending on
option argument
  case option of
     0: polyfill, x, y, /DEVICE
     1: begin
       image = replicate(0B, 500, 500)
       p = polyfillv(x, y, 500, 500)
```

tv, image

if min(p) gt 0 then image[p] = 255B

```
end
```

```
2: begin
       dname = !d.name
       set_plot, 'Z'
       device, SET_RESOLUTION=[500,500]
       erase
       polyfill, x, y, /DEVICE
       image = tvrd()
       set_plot, dname
       tv, image
    end
    3: begin
       roi = obj_new('IDLanROI', x, y)
       image = roi->ComputeMask(DIMENSIONS=[500,500])
       obj_destroy, roi
       tv, image
    end
  endcase
end
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