Subject: Re: Strange behavior of POLYFILL Posted by Xavi Llort on Wed, 21 Sep 2011 09:11:21 GMT

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I was meaning POLYFILLV instead of POLYFILL, sorry!

And by the way, I tested on 2 machines:

```
IDL> help, !version,/str
** Structure !VERSION, 8 tags, length=104, data length=100:
 ARCH
             STRING 'x86 64'
 OS
            STRING
                    'linux'
 OS FAMILY
                STRING
                         'unix'
 OS NAME
                STRING
                        'linux'
 RELEASE
               STRING
                        '8.0'
                STRING 'Jun 18 2010'
 BUILD_DATE
 MEMORY BITS
                  INT
                            64
 FILE OFFSET BITS
          INT
                    64
IDL> help, !version, /str
** Structure !VERSION, 8 tags, length=76, data length=76:
 ARCH
             STRING
                      'i386'
 OS
           STRING
                    'darwin'
 OS FAMILY
                STRING
                         'unix'
                STRING
                        'Mac OS X'
 OS NAME
 RELEASE
               STRING
                         '7.0'
 BUILD DATE
                STRING 'Oct 25 2007'
 MEMORY BITS
                  INT
                            32
 FILE OFFSET BITS
          INT
                    64
```

Subject: Re: Strange behavior of POLYFILL Posted by David Fanning on Wed, 21 Sep 2011 13:21:58 GMT View Forum Message <> Reply to Message

## Xavi Llort writes:

- > After hours fighting against POLYFILLV, I found a strange
- > behavior that I cannot understand...
- > Deliavior that i carmot understand.
- > Here there is a small code searching the points inside a triangle. Why
- > there is a point that clearly is inside the triangle and not retrieved
- > by PolyfillV (see plot)? Does anyone have a solution?

I don't have time this morning to look at this very carefully, but I will say that PolyFillV is a \*graphic\*

solution, not an \*analytical\* solution. It seems to me you are looking for an analytical solution. If so, there are better ways. IDLanROI is one and here is an article that describes another:

http://www.idlcoyote.com/tips/point\_in\_polygon.html

Cheers,

David

--

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

Subject: Re: Strange behavior of POLYFILL Posted by Xavi Llort on Thu, 22 Sep 2011 10:41:22 GMT View Forum Message <> Reply to Message

Thanks for the answer,

But I also coded an analytical solution. The point is that I need a really fast way to obtain all the points inside a polygon rather than testing one by one.

I have to calculate this for ~1.E6 different polygons in less than 4 minutes and all analytical solutions do not fulfill the benchmark. POLYFILLV does, but giving a wrong answer!!

I ended in this simple polygon (a triangle) that instead of retrieving 10 points is only retrieving 9 (clearly seen in the plot). I do not know if it is really an IDL bug or I'm doing something wrong...

Subject: Re: Strange behavior of POLYFILL Posted by David Fanning on Thu, 22 Sep 2011 12:28:18 GMT View Forum Message <> Reply to Message

## Xavi Llort writes:

- > I have to calculate this for ~1.E6 different polygons in less than 4
- > minutes and all analytical solutions do not fulfill the benchmark.
- > POLYFILLV does, but giving a wrong answer!!

Yes, the price of speed! :-)

Ronn Kling had an analytical solution that could do many points at once and I believe was fast. I can't find it now, and I'm just leaving the office for a few days. You might check on Ronn's web page:

http://www.kilvarock.com

Cheers,

David

--

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

Subject: Re: Strange behavior of POLYFILL Posted by Xavi Llort on Fri, 23 Sep 2011 09:48:58 GMT View Forum Message <> Reply to Message

Thank you very much for the alternative!

It works (below there is a piece of code comparing against POLYFILLV), but the computational is quite high, specially searching in a large number of points.

In my case (a 1024 by 1024) the overall time goes from ~1.E-5 secs of POLYFILLV to ~2 secs of Ronn Kling's routine, and I cannot afford.

Is this a bug of POLYFILLV? Does anyone experienced similar problems?

Thanks again for your help, Xavi Llort

```
PRO POLY_HELL_2

dim_x = 1024l & dim_y = 1024l

lon_res = 0.02 & lat_res = 0.02

lon_arr = FINDGEN(dim_x)*lon_res - 12.99

lat_arr = FINDGEN(dim_y)*lat_res + 29.53

triangle_xx = [-4.27, -4.3221145, -4.3234300, -4.27]

triangle_yy = [35.449997, 35.535344, 35.365467,35.449997]
```

```
; POLYFILL calculus
t0 = SYSTIME(/SEC)
xx_n = (triangle_xx - lon_arr[0]) / lon_res +1.
yy_n = (triangle_yy - lat_arr[0]) / lat_res +1.
points_in = POLYFILLV(xx_n, yy_n, dim_x, dim_y)
lap1 = SYSTIME(/SEC) - t0
DEVICE, DEC=0
LOADCT, 5
WINDOW, 0, XSIZE=800, YSIZE=800, TITLE='RESULT WITH POLYFILL'
PLOT, triangle_xx, triangle_yy, PSYM=-4, XR=[-4.39, -4.15], XSTYLE=1,
$
 YR=[35.33, 35.57], YSTYLE=1
lon_mat = REBIN(lon_arr, dim_x, dim_y)
lat mat = REBIN(TRANSPOSE(lat arr), dim x, dim y)
OPLOT, Ion mat, lat mat, psym=1, SYMSIZE=0.7
OPLOT, lon mat[points in], lat mat[points in], psym=4, SYMSIZE=1.4,
COLOR=115, THICK=2.
; Ron Kling calculus
t1 = SYSTIME(/SEC)
lon_vals = REFORM( REBIN(lon_arr, dim_x, dim_y), dim_x*dim_y)
lat_vals = REFORM( REBIN(TRANSPOSE(lat_arr), dim_x, dim_y),
dim x*dim y)
data = TRANSPOSE([[lon_vals],[lat_vals]])
connect = REFORM(INDGEN(3),3,1)
points in Kling = pointInsideApolygon (triangle xx[0:2],
triangle_yy[0:2], connect, data)
lap2 = SYSTIME(/SEC) - t1
WINDOW, 1, XSIZE=800, YSIZE=800, TITLE='RESULT WITH RONN KLING
ROUTINE'
PLOT, triangle_xx, triangle_yy, PSYM=-4, XR=[-4.39, -4.15], XSTYLE=1,
 YR=[35.33, 35.57], YSTYLE=1
OPLOT, Ion vals, lat vals, psym=1, SYMSIZE=0.7
OPLOT, Ion vals[points in Kling], lat vals[points in Kling], psym=4,
SYMSIZE=1.4, COLOR=115, THICK=2.
PRINT, ''
PRINT, '*** POLYFILL used ' + STRING(lap1,FORMAT='(E9.3)') + '
seconds'
PRINT, '*** Ronn Kling used ' + STRING(lap2,FORMAT='(E9.3)') + '
seconds'
```

Subject: Re: Strange behavior of POLYFILL Posted by Xavi Llort on Tue, 27 Sep 2011 13:06:46 GMT View Forum Message <> Reply to Message

Dear all again,

I've tested massively the POLYFILLV against Ronn Kling's routine and Polyfillv is preforming quite a lot of errors...
I wonder if there is a way to report it to ITT, does anyone know how to do it?

Maybe it can be corrected for future versions and we will have the wonderful the exactness of Ronn's routine with the speed of Polyfillv...

Thanks, Xavi