Subject: Re: point inside polygon
Posted by wmc on Wed, 01 Apr 1998 08:00:00 GMT
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> This function determines if a point is inside a polygon or not. If you
> have several points I believe you are better off with the polyfillv approach.
> Baard

```
> FUNCTION inside, x, y, px, py
(some bits cut)
>     sx = size(px)
>     sy = size(py)
>     N=sx(1)
>     tmp_px =  [px, px[0]]                    ; Close Polygon in x
>     tmp_py =  [py, py[0]]                    ; Close Polygon in y
>     i  = indgen(N)                          ; indices 0...N-1
>     ip = indgen(N) + 1                       ; indices 1...N
>     X1 = tmp_px(i)  - x &   Y1 = tmp_py(i)  - y
>     X2 = tmp_px(ip) - x &   Y2 = tmp_py(ip) - y
>     dp = X1*X2 + Y1*Y2                        ; Dot-product
>     cp = X1*Y2 - Y1*X2                       ; Cross-product
>     theta = atan(cp,dp)
>     IF (abs(total(theta)) GT 1.0E-8) THEN return,1 ELSE return,0
> END
```

Interesting... there had to be a better way and this looks like it.
I'm now trying to work out why it works... I think you're counting up the angles
going round the polygon to the point, and the sum is zero outside and 2*!pi
inside.

Only one criticism: 1e-8 is too tight a test for single precision:
inside(.5,1.5,[0,1,1,0],[0,0,1,1]) returns 1
since total(theta) is -1.19e-7.
But inside(.5,1.5d0,[0,1,1,0],[0,0,1,1]) returns 0 as it should.
So I think the test should be 1e-5 or somesuch (though presumably .1 would work
just as well?).

- William

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