Subject: partial derivatives of f(x,y) Posted by brooker on Wed, 12 Apr 1995 07:00:00 GMT

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I have a 2d function z=f(x,y). I need to calculate the partial derivatives df/dx and df/dy for all the grid points. Is there a routine for this somewhere?

Thanks-Peter Brooker

Subject: Re: partial derivatives of f(x,y)
Posted by bowman on Fri, 14 Apr 1995 07:00:00 GMT
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In article <3mmmpv\$g0I@agate.berkeley.edu>, korpela@albert.ssl.berkeley.edu (Eric J. Korpela) wrote:

- > In article <D6xz1s.ADE@ireq.hydro.qc.ca>,
- > <brooker@toka.ireq-ccfm.hydro.qc.ca> wrote:
- >> I have a 2d function z=f(x,y). I need to calculate
- >> the partial derivatives df/dx and df/dy for all the
- >> grid points. Is there a routine for this somewhere?

>

- > delta=some\_small\_number ;compared to the grid spacing
- > dz\_dx=(f(x+delta,y)-f(x-delta,y))/(2.0\*delta)
- $> dz_dy=(f(x,y+delta)-f(x,y-delta))/(2.0*delta)$

## Perhaps he wanted:

```
z = FLTARR(nx,ny)
dzdx = FLTARR(nx,ny)
dzdy = FLTARR(nx,ny)

FOR j = 0, ny-1 DO $
    dzdx(*,j) = (ROTATE(z(*,j),-1) - ROTATE(z(*,j),1))/(2.0*dx)
FOR j = 1, ny-2 DO $
    dzdy(*,j) = (z(*,j+1) - z(*,j-1))/(2.0*dy)
```

...then whatever you want to do for the normal derivatives on the boundaries...

You could do this without the ROTATE's by looping over i for dzdx, but then you would access memory with a large stride. I think this will use the cache much more efficiently on most workstations.

Regards, Ken Bowman

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Dr. Kenneth P. Bowman Associate Professor Department of Meteorology Texas A&M University College Station, TX 77843-3150 409-862-4060 409-862-4132 fax bowman@csrp.tamu.edu PP-Glider

Subject: Re: partial derivatives of f(x,y)
Posted by korpela on Fri, 14 Apr 1995 07:00:00 GMT
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In article <D6xz1s.ADE@ireq.hydro.qc.ca>, <brooker@toka.ireq-ccfm.hydro.qc.ca> wrote: > I have a 2d function z=f(x,y). I need to calculate > the partial derivatives df/dx and df/dy for all the > grid points. Is there a routine for this somewhere? Provided free of charge....... (Unless Unisys has patented it:)) Assuming x and y are arrays..... delta=some small number; compared to the grid spacing  $dz_dx=(f(x+delta,y)-f(x-delta,y))/(2.0*delta)$ dz dy=(f(x,y+delta)-f(x,y-delta))/(2.0\*delta)Eric Eric Korpela A day without meetings is like korpela@ssl.berkelev.edu I work. <a href=" http://www.cs.indiana.edu/finger/mofo.ssl.berkeley.edu/korpe la/w">Click here for more info.</a>