Subject: Re: Removing if then else loop for efficiency Posted by Tom Ashbee on Tue, 12 Jan 2010 13:09:13 GMT

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On Jan 10, 6:25 pm, pp <pp.pente...@gmail.com> wrote:
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- > I think this does the same as your code, but it does not use any
- > loops, and it should be much faster and easier to read:

>

- > function velocities,t,xyvec
- > compile optidl2
- > ;Constants
- > N=50
- > R=5d0
- > ;Unpack the input
- > xvec=xyvec[0:N-1]
- > yvec=xyvec[N:(N*2)-1]
- > ;Temporary arrays for x[i], x[i], y[i], y[i]
- > xj=rebin(xvec,N,N)
- > xi=transpose(xi)
- > yj=rebin(yvec,N,N)
- > yi=transpose(yi)
- > :Repeated terms in the expressions
- $> tmp1=(xi-xj)^2+(yi-yj)^2$
- $> tmp2=R^2/(xj^2+yj^2)$
- $> tmp3=(xi-xj*tmp2)^2+(yi-yj*tmp2)^2$
- > ;Terms of dxdt,dydt present everywhere
- > dxdt=-(yi-yj*tmp2)/tmp3
- > dydt=(xi-xj*tmp2)/tmp3
- > ;Terms present only out of the diagonal
- > tmp4=1d0-identity(N); this is 0 in the diagonal, 1 out of it
- > dxdt+=((yj-yi)/tmp1)*tmp4
- > dydt=((xi-xj)/tmp1)*tmp4
- > ;Put the gamma factor
- > gamm=rebin(gamma(N,2.0d,10.0d)/(2d0*!dpi),N,N); this does not seem to
- > be IDL's gamma function
- > dxdt*=gamm
- > dydt*=gamm
- > ;Sum over the rows
- > dxvecdt=total(dxdt,1)
- > dyvecdt=total(dydt,1)
- > ;Pack the results
- > z=[dxvecdt,dyvecdt]
- > return,z
- > end

- > You should check that I did not misidentify anything, which would not
- > have been difficult in such convoluted expressions.

>

- > Other points to note:
- >
- > 1) Do not use () for array indexes. Use [] instead. That makes it
- > unambiguous that it is an array index, and not a function call.

>

> 2) When using doubles, as you did, use !dpi instead of !pi.

>

- > 3) Your function has an argument t that is not used anywhere in it. I
- > left it there, so that the argument order does not change.

Hi,

thanks a lot for this; it was very insightful and helpful. Unfortunately it's just giving NaNs for z at the moment but I'm working on debugging it.

Thanks again