Subject: Re: Removing if then else loop for efficiency
Posted by penteado on Sun, 10 Jan 2010 18:25:16 GMT
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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_opt idl2
;Constants
N=50
R=5d0
;Unpack the input
xvec=xyvec[0:N-1]
yvec=xyvec[N:(N*2)-1]
;Temporary arrays for x[j], x[i], y[j], y[i]
xj=rebin(xvec,N,N)
xi=transpose(xj)
yj=rebin(yvec,N,N)
yi=transpose(yj)
;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.

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