Subject: for loop is killing me
Posted by tarequeaziz on Tue, 06 Nov 2007 06:31:24 GMT
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Hello all,

help me! I am running a code 'infested' with for loops.And as u can guess, its painfully slow. The part of my code with loop looks like the following:

```
jump1:

;Setting up the Green functions array which will have the same number
of elements as of amp_vec

G=fltarr(n_elements(amp_vec),n_elements(amp_vec))
G_phi=fltarr(n_elements(amp_vec))
G_rp=fltarr(n_elements(amp_vec))
G_r=fltarr(n_elements(amp_vec))
G_in=fltarr(n_elements(amp_vec))
G_out=fltarr(n_elements(amp_vec))
G_p=fltarr(n_elements(amp_vec))
G_h=fltarr(n_elements(amp_vec))
gp=fltarr(n_elements(amp_vec))
gh=fltarr(n_elements(amp_vec))
G_in_msum = fltarr(n_elements(amp_vec))
G_out_msum = fltarr(n_elements(amp_vec))
G_in_phisum = fltarr(n_elements(amp_vec))
G_out_phisum = fltarr(n_elements(amp_vec))



if ignore_realdata eq 1. then begin
  amp_vec= abs(randomn(0.5,n_radial_points,/double))
  a=1.
 ;print,' amp_vec is',amp_vec
endif

do_u_like_to_start_with_rp_loop = 0 ; Set 1 if YES,0 if NO

if do_u_like_to_start_with_rp_loop eq 1. then BEGIN
  PRINT,' WE ARE USING rp PREFERED LOOP'
  goto,jump2

ENDIF
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PRINT,' WE ARE USING r PREFERED LOOP'
  for i_r= 0,n_radial_points-1 do begin

   loop_time = systime(1)

   if ignore_realdata eq 1. then begin

    r_scld=( i_r*2.)/(n_radial_points -1)    ;---------> We took off
trap radius from here for scaling purpose,see note

       ;---------> Also note the use of factor 2. This is because, we
want to get values outside
                                                ;----------
>  the cylinder. But this is just for demonstration purpose!!!!
   endif else begin

    r_scld=( i_r)/(n_radial_points -1)  ; took off the factor 2

   endelse
   ;r_scld = 2.

   ;print,'r_scld value is ',r_scld

    for i_rp= 0,n_radial_points-1 do begin


      if ignore_realdata eq 1. then begin

       rp_mat = randomn(1,n_radial_points,/double)
          ;print,'rp_mat is',rp_mat

             rp_scld = rp_mat(i_rp)

      endif else begin

       ;rp_scld=( i_rp/((n_radial_points-1))) * float(amp_vec(i_rp))
       rp_scld= float(amp_vec(i_rp))
       ;print,' amp_vec is',amp_vec

      endelse




    ; rp_scld=( i_rp/((n_radial_points-1))) * float(amp_vec(i_rp))

     ;rp_mat = randomn(1,n_radial_points,/double)
    ; print,'rp_mat is',rp_mat
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```
    ;rp_scld = rp_mat(i_rp)

    ;rp_scld = 0.5


    ;;print,'rp_scld for i_rp= ',i_rp,' is,  ',rp_scld

     if (r_scld gt rp_scld) then begin
      r_plus = r_scld
      r_minus = rp_scld
     endif else begin
      r_minus = r_scld
      r_plus = rp_scld
     endelse

    ;print,'r_plus value is ',r_plus
    ;print,'r_minus value is ',r_minus

     for i_m=1,20 do begin       ;n_radial_points do begin

     ;;print,'starting i_m value is ',i_m

     ;if  (n_radial_points le 5) then i_phi_max = 20 else i_phi_max =
n_radial_points
     ;print,'i phi  max is =  ',i_phi_max
     i_phi_max = 20.

       for i_phi=0,i_phi_max - 1 do begin
        ; print,'starting i_phi value is',i_phi

         count= i_phi + 1.
           ;print,'count is ',count
         phi=(count*2*!PI)/(i_phi_max)

        ; print,'phi value is= ',phi
        ; phi= 0.785398163  ; <----- In radian

        a= 1.  ; -----> Scaled trap radius

        gp(i_phi) = 2.0*(1./i_m)*(r_minus/r_plus)^i_m  *
cos(i_m*(phi))
        gh(i_phi) = 2.0*(1./i_m)*(r_minus * r_plus/a^2)^i_m  *
cos(i_m*(phi))

        ;print,'cos(i_m*phi) is',cos(i_m*phi)

       ;if  (i_r eq 0.)  &&  (i_rp eq 0.) && (i_m eq 1.)   then begin
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```
         ;print,' the 1st gp is ',gp(i_phi)
         ;print,' the 1st gh is ',gh(i_phi)
        ;endif

          ;if  (i_r eq n_radial_points  - 1.)  &&  (i_rp eq
n_radial_points -1.) && (i_m eq n_radial_points -1.)   then begin

         ;print,' the Last gp is ',gp(i_phi)
         ;print,' the Last gh is ',gh(i_phi)

        ;endif

        endfor ; end of phi loop


       G_in_phisum [i_m -1] =  total(gp)  ; Add up the phi elements
for a specific m
       G_out_phisum [i_m -1] = total(gh)



      endfor  ; end of m-loop


     G_in_msum(i_rp) =  total(G_in_phisum)  ; Add up all m values for
a specific rp value
     G_out_msum(i_rp) = total(G_out_phisum)

     G_in(i_rp) = -alog((r_plus)^2.) + G_in_msum[i_rp]
     G_out(i_rp) = -alog((a^2./rp_scld)^2.) + G_out_msum[i_rp]


     ;print,'G_in is',G_in
     ;print,'G_out is',G_out

     G(i_r,i_rp)= G_in(i_rp) - G_out(i_rp) - alog((a/rp_scld)^2.)

      index=where(finite(G,/NaN) ,count)
      ;print,' index is ',index
        if (count ne 0) then G[index] = 0.
;      non_zero = where(G,count)
;      print,'non zero value is',non_zero
;
;      if count ne 0. then G = G[non_zero]


     ;print,' last log part',alog((a/rp_scld)^2.)
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```
     ;print,' G_in - G_out is  ',G_in - G_out
       ;print,'G inside rp loop is  ',G(i_r,i_rp),' for i_r =',i_r,'
and i_rp =',i_rp


    endfor  ;end of rp loop


   ;G_p= G_in
   ;G_h= G_out
   ;print,'G_p is',G_p,'and G_h is',G_h
    ;G(i_r,i_rp)= G_p(i_rp) - G_h(i_rp) - alog((a/rp_scld)^2.)

   ;print,'rp_scld is ',rp_scld

  ; print,' G inside the r loop is',G

 ; if i_r eq (n_radial_points-1) then print,'Last r_scld value is=',
r_scld

 ;if i_r eq  ( (n_radial_points-1)/10.)  then print,'First 1/10th
r_scld value is=', r_scld
 ;if i_r eq  ( (n_radial_points-1)/2.)  then print,'First 1/2th
r_scld value is=', r_scld
 ;if i_r eq  ( (n_radial_points-1)*3./4.)  then print,'3/4 th r_scld
value is=', r_scld
 ;if i_r eq (n_radial_points-1) then print,'Last r_scld value is=',
r_scld

 if i_r eq (n_radial_points - 1.) then begin

 print,'The time it took to finish  ',i_r,'th loop is', systime(1) -
loop_time,'seconds'

 endif

  endfor ; end of r loop


  ;print,'here is the PROFILER report for r prefered loop'

       ;print,'G is  ',G       ;[n_radial_points - 1]


if ignore_realdata eq 1 then begin

     r_vec=(findgen(n_radial_points)/(n_radial_points))
    potential=fltarr(n_radial_points)
```

```
  prod = fltarr(n_radial_points)

endif else begin

  r_vec=(findgen(n_theta_points)/(n_theta_points))
     potential=fltarr(n_theta_points)
  prod = fltarr(n_theta_points)
endelse

if ignore_realdata eq 1 then p= n_radial_points else p= n_theta_points



  for k = 0,100 do begin ;p -1 do begin
    ;rp_mat = randomn(1,n_radial_points,/double)
    ;print,' amp_vec is',amp_vec
    ;print,'amp_vec is',amp_vec[k]
    ;print,'G[*,k] is',G[*,k]
     prod =amp_vec[k] * G(*,k)
     prod_invfft = abs( fft(prod,/inverse))
     potential[k] = int_tabulated(r_vec,prod_invfft)
    ;print,'potential is',potential



=====
 So as u can see there are 4 for loops running. the m loop with
running index i_m should be 200. But setting it to 200 slows down the
program.

My supervisor said that, this should be a very fast way of calculating
green function than the traditional way(which my group-mate is doing).

what I am doing wrong?
Any help will be HIGHLY appreciated!


Best,

Tareque
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