Subject: Transpose(A)*P*A
Posted by mapper4u6@gmail.com on Fri, 10 Oct 2008 14:25:07 GMT
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hello,

I have a question about how to improve the computation speed when deal with non-linear equation
A x = l, P is the weight for each row, P is M*M
M*N N*1 M*1

then I have to build normal matrix which is
Transpose(A)*P*A x = Transpose(A)*P*l
N*N N*1 N*1

then x can be solved.

When M is bigger as 20000, N as 3000, the time to build AtPA is almost one hour, that is too long. the code is:

```
PRO NormalMatrix, A, l, ATPA, ATPL, Weight = P
 szA = SIZE(A, /DIMENSIONS)
 if N_ELEMENTS(szA) ne 2 then begin
  mess = dialog_message('Input matrix must be M*N format!', /
information)
  return
 endif
 szL = SIZE(L, /DIMENSIONS)
 if (N_ELEMENTS(szL) ne 2 and szL[0] ne 1) then begin
  mess = dialog_message('Input l must be 1*M format!', /information)
  return
 endif
 if (szA[1] ne szL[1]) then begin
  mess = dialog_message('Input A and l must be same rows!', /
information)
  return
 endif
 if not keyword_set(P) then P = fltarr(szA[1])*0.0+1.0
 ATPA = fltarr([szA[0], szA[0]])
 ATPL = fltarr(1, szA[0])

 for i=0L, szA[0]-1 do begin
  t1 = systime(1)
  ATPA[i, i:szA[0]-1] = (p*A[i, *])##A[i:szA[0]-1, *]
  ATPA[i:szA[0]-1, i] = ATPA[i, i:szA[0]-1]
  ATPL[0, i] = (p*A[i, *])##l
```

```
  t2 = systime(1)
  print, sza[0], i, t2-t1
endfor

END
```

I like to know how I can improve it to few seconds.
