**princ.f90**

! program iterativo

! programa principal para metodos iterativos

 parameter (np=10)

 dimension a(np,np),x(np),b(np),d(np)

 common /sor/ w

! external func,f1

 open(unit=1,file='input.txt',status='old')

 open(unit=2,file='output.txt',status='unknown')

!

! Leitura de dados

!

 read(1,\*)n,tol,maxit,w

 write(\*,\*)'n= ',n,'tol=',tol,'maxit=',maxit,'w=',w

 pi=4\*atan(1.d0)

 write(\*,\*)'pi= ',pi

! b=pi/2

 read (1,\*) (b(i),i=1,n)

 write(\*,\*)'b(i)=', (b(i),i=1,n)

 write(\*,\*)'a matriz a(i,j) eh:'

 do i=1,n

 read(1,\*) (a(i,j),j=1,n)

 write(\*,\*)(a(i,j),j=1,n)

 enddo

 call gseidl(maxit,n,np,a,x,b,tol)

 do i=1,n

 write(2,\*)'a solucao e x(',i,')=',x(i)

 write(\*,\*)'a solucao e x(',i,')=',x(i)

 enddo

 stop

 end

!----------------------------------

 function vnorm(x,n,np)

 dimension x(np)

 sum=0.d0

 do i=1,n

 sum=sum+x(i)\*x(i)

 enddo

 vnorm=sqrt(sum)

 return

 end

**input.txt**

4 1.d-6 1000 1.d0 ! n, tol, maxit , w

12.d0 34.d0 27.d0 -38.d0 ! b(i)

6.d0 -2.d0 2.d0 4.d0 ! a(1,j)

12.d0 -8.d0 6.d0 10.d0 ! a(2,j)

3.d0 -13.d0 9.d0 3.d0 ! a(3,j)

-6.d0 4.d0 1.d0 -18.d0 ! a(4,j)

**gauss.f90**

 subroutine gseidl(m,n,np,a,x,b,tol)

 parameter (nmax=10)

 dimension a(np,np),x(np),b(np),r(nmax)

 common /sor/ w

!

!

 do k=1,m

! check convergence

 do i=1,n

 sum=0.d0

 do j=1,n

 sum=sum+a(i,j)\*x(j)

 enddo

 r(i)=b(i)-sum

 enddo

 rnorm=vnorm(r,n,np)

 write(2,\*)'|r| = ',rnorm

 if(rnorm.le.tol) goto 300

! Gauss or SOR iteration

 write(2,\*)'iteracao k = ',k

 ki = k

 do i=1,n

 sum=0.d0

 do j=1,n

 if(j.ne.i) then

 sum=sum+a(i,j)\*x(j)

 endif

 enddo

 x(i)=(w\*(b(i)-sum)+(1.d0-w)\*a(i,i)\*x(i))/a(i,i)

 write(2,\*) 'x(',i,')=',x(i)

 enddo

 enddo

 write(2,\*)'nao convergiu, rnorm=',rnorm,' k= ',ki

 write(\*,\*)'nao convergiu, rnorm=',rnorm,' k= ',ki

! pause

 stop

300 continue

 write(2,\*)'convergiu, rnorm=',rnorm,'na iteracao k=',ki

 write(\*,\*)'convergiu, rnorm=',rnorm,'na iteracao k=',ki

 return

 end

!----------------------------------