Algorithm 3: Secant method and Inverse linear interpolation

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| Method introduction: |
| 简单叙述这个方法的计算思想，计算公式，适用对象，优缺点等内容。这部分属于偏数学的东西。  （英文书写不要超过1页）  Compute formular:x^(k+1)=x^k+Wdelt^k |
| Algorithm Design |
| Same as Gauss\_sedial,just add to a variable,namely w,here,if 0<w<1,we call it under-relaxation;ifw>1,we say we are using over\_relaxation. |
| Matlab code |
| function [x1, eor, iterations] = SOR( A, b, x0, omega, tol, Max\_iterations)  %JACOBI Jacobiµü´úÇó½âÏßÐÔ·½³Ì×é  % ´Ë´¦ÏÔÊ¾ÏêÏ¸ËµÃ÷  % [m, n] = size(A);  if nargin<6  Max\_iterations = 500;  elseif nargin < 5  tol = 1e-6;  elseif nargin <4  omega = 1.6;  elseif nargin <3  x0 = zeros(size(A,1),1);  elseif nargin<2 || nargin>7  error('Input error!');  end  L = tril(A, -1);  D = diag(diag(A));  U = triu(A, 1);  E = inv(D+omega\*L)\*((1-omega)\*D-omega\*U);  f = omega\*inv(D+omega\*L)\*b;  for i = 1: Max\_iterations  x1 = E\*x0+f;  eor = norm(x1-x0,1);  if(eor < tol)  fprintf('The iteration convergened.\n');  break;  end  x0 = x1;  end    if(i == Max\_iterations)  fprintf('Reached max iterations.\n');  end  iterations = i;  end |
| Examples and Result |
| Example3.1.1  A=[4 2 1;1 3 1;1 1 4;];b=[3;-1;4];x0=[0;0;0];omega=1;tol=10^(-6);Max\_iterations=50;  [x1, eor, iterations] = SOR( A, b, x0, omega, tol, Max\_iterations)  Results:  x1 =  1.0000  -1.0000  1.0000  eor =  6.9282e-07  iterations =  11  Remarks |
| 此处写该方法程序设计的一些注意事项，也可以空白 |
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