

Computer Homework 2

便笺标题

2011/4/12

求解

$$Au=b$$

$$h=1/n$$

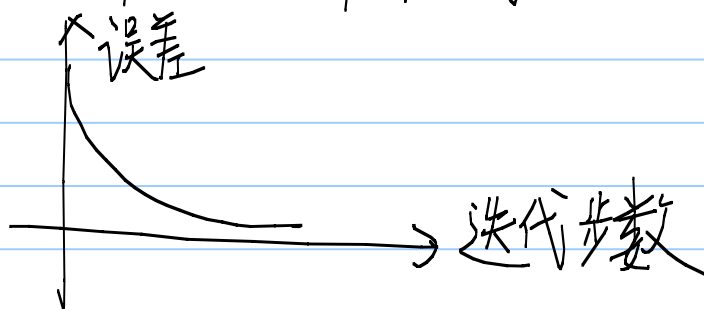
$$A = \frac{1}{h^2} \begin{pmatrix} 2 & -1 & & \\ -1 & 2 & -1 & \\ & \ddots & \ddots & \ddots \\ & & -1 & 2 \end{pmatrix}$$

$$b_i = f(x_i) \quad i=1, \dots, n-1$$

$$x_i = i \cdot h$$

$$f(x) = e^x$$

1. 用追赶法求解并绘出 (x_i, u_i) 的图像,
2. 用Jacobi, Gauss-Seidel, SOR, SDM, CGM迭代求解方程组并作图:



3. 选做: 用多重网格法求解.

4. 比较当 n 增加时, u_i 与 $u(x) = e^x - [(e-1)x+1]$ 在 x_i 取值的图像.