# 上机大作业说明

1. 程序语言可用Matlab, C, Fortran等.

2. 三次上机作业为大作业，成绩占课程考核的20%.

word文件包含以下内容：

1）问题；2）算法公式或原理；3）程序和程序结果；

4) 问题和算法分析.

3. 文件命名：学号+姓名

4. 提交方式：

每班两个文件包:(1)每个同学的word文档;(2)每个同学的程序包. 第9周周一前统一收齐.

# 第一次上机作业

## 第6,7章

## 第6章:6-2（7版） P368: 5(e), 8, 9

Using 1) Gaussian elimination

2) Gaussian elimination with partial pivoting.

3*) Gaussian elimination with scaled partial pivoting.

and three-digit chopping arithmetic to solve the following linear systems, and compare the approximations to the actual solution.

$$1.19x1 + 2.11x2 - 100x3 + x4 = 1.12,$$
$$14.2x1 - 0.122x2 + 12.2x3 - x4 = 3.44,$$
$$100x2 - 99.9x3 + x4 = 2.15,$$
$$15.3x1 + 0.110x2 - 13.1x3 - x4 = 4.16.$$

Actual solution [0.176, 0.0126, −0.0206, −1.18].

第6章:6-6, (7版)P411: 7

## Doolittle factorization

Solve $Ax = b$ using the Crout factorization for tridiagonal systems.

Let $A$ be the $10 \times 10$ tridiagonal matrix given by

$$a_{ii} = 2,\ a_{i,i+1} = a_{i,i-1} = -1, \quad \text{for each } i = 2, \ldots, 9,$$

and $$a_{11} = a_{10,10} = 2,\ a_{12} = a_{10,9} = -1.$$

Let b be the ten-dimensional column vector given by

$b_1 = b_{10} = 1$ and $b_i = 0$, for each $i = 2, 3, \ldots, 9$.

第7章：

分别用Jacobi, GS, SOR(ω=1.2)方法求解方程组Ax=b，

x0=[0 0 … 0]’； e=$10^{-5}$

$$a_{ij}=\begin{cases}2i, & when\ \ j=i \quad and \quad i=1,2,\cdots,40\\ -1, & when\begin{cases}j=i+1 \quad and \quad i=1,2,\cdots 39\\ j=i-1 \quad and \quad i=2,3,\cdots,40\end{cases}\\ 0, & otherwise\end{cases}$$

and $b_i = 1.5i - 6$, for each $i = 1, 2, \ldots, 40$.