ESO 208A: Computational Methods in Engineering

Tutorial 5

Round-errors and partial pivoting

1. Use Gauss elimination method and four-digit floating point arithmetic with rounding to solve:

$$0.003x + 59.14y = 59.17$$
$$5.291x - 6.130y = 46.78$$

2. Solve the previous problem by using Gauss elimination with partial pivoting and four-digit rounding arithmetic.

Matrix Decomposition

3. Solve the following system of linear equation by using (i) Gauss elimination, (ii) Doolitte decomposition and (iii) Crout decomposition.

$$5x_1 + x_2 = 7$$
$$x_1 + 5x_2 + x_3 = 14$$
$$x_2 + 5x_3 = 17$$