

## Assignment 2: Gauss-Seidel Method

### Question 1:

The system of linear algebra of Lab 1 is as follows:

$$\begin{bmatrix} -\alpha & 1 & 0 \\ 1 & -\alpha & 1 \\ 0 & 1 & -\alpha \end{bmatrix} \begin{bmatrix} h_2^{\Delta t} \\ h_3^{\Delta t} \\ h_4^{\Delta t} \end{bmatrix} = \begin{bmatrix} -\beta h_2^0 - h_1^{\Delta t} \\ -\beta h_3^0 \\ -\beta h_4^0 - h_5^{\Delta t} \end{bmatrix}$$

The unknowns are  $\begin{bmatrix} h_2^{\Delta t} & h_3^{\Delta t} & h_4^{\Delta t} \end{bmatrix}^T$ . Find the values of the other variables and solve the system of linear algebra for the unknowns using the Gauss-Seidel method.

### Question 2:

Solve the above problem using the Thomas algorithm, or the LU decomposition method.