Lab 0: ForwardOneLoop Function Explanation

Introduction

The ForwardOneLoop function is designed to perform forward elimination on a given augmented matrix to solve a system of linear equations. This document explains how the matrices were derived for the code in the ForwardOneLoop function.

Mathematical Explanation

In the ForwardOneLoop function, the objective is to transform the given augmented matrix into an upper triangular form. To do this, the function iterates through the matrix and applies forward elimination steps.

For a given row 'j' and a pivot row 'i', the algorithm calculates the factor as follows:

```
factor = matrix[j][i] / matrix[i][i]
```

Using this factor, the function updates each row 'j' below the pivot row 'i' as follows:

```
matrix[j][k] -= factor * matrix[i][k]
```

where 'k' iterates from 'i' to 'n + 1' (inclusive). This ensures that the resulting matrix after the ForwardOneLoop function will be an upper triangular matrix.