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All work done in this project is my own unless stated otherwise

INTRODUCTION

This project deals with solving linear systems of equations, .

In the first section I implement a function Guass() that uses Gaussian Elimination to turn an inputted matrix, **,** into a upper diagonal matrix through which I can then use backwards substitution to get the answer vector, .

In the second section I implement a BGauss() function which solves a banded linear system of equations. That is a system where the matrix, , has non-zero terms only on the diagonal and a certain number of diagonal bands removed from the central diagonal.

In section 3, I solve a certain case of Poisson’s equation for the 1D case using my Gauss() and BGauss() functions and compare the two methods.

In section 4, I solve a similar form of Poisson’s 1D equation from section 3 but for the 2D case instead and again compare the Gauss() function to the BGauss() function.

Finally, in the Mastery Section I solve Poisson’s Equation for the 3D case.

The Functions

Question 4

Number of operations needed to do when we try to minimize operations would be 0 as

Number of operations needed to do when we try to minimize operations would be 4 as

Number of operations needed to do when we try to minimize operations would be 6 as

Number of operations needed to do when we try to minimize operations would be 4 as

So