# PDC Project Proposal

# Gaussian Elimination Optimization


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### Project description:

Solving Linear Algebra problems requires the use of matrices. These matrices can have several rows and columns making it a tedious process to solve. Hence forth, this program will optimize the process of solving these matrices through parallelism using OpenMP and MPI.

### Problem and its solution:

Gaussian Elimination requires many calculations and requires performing different tasks on the same set of data. In order to boost the performance of our program, we will apply OpenMPI and MPI, to run the program in parallel, and check the execution time between serial and parallel systems and between OpenMP and MPI.

- Where is the program from?
    - Solving one of the mathematical calculations of Linear Algebra known as Gaussian Elimination.
- What are similar solutions?
    - Row Echelon
    - Row Reduction Echelon
    - Gauss Jordan Elimination
    - LU Decomposition
- What problem is it solving?
    - Parallel Execution of row and column based operations on the matrix, and increasing the speed of execution of the program.
- Parallel problems in the selected problem?
    - Breaking down the problem into different chunks i.e row based operations, column based operations.
- Highlights of existing problems in OpenMP and OpenMPI?
    - Matrix Multiplication.