1. **Abstract**: half-page
2. **Introduction**
   1. I will solve the following Poisson equation:

Where:

Assuming boundary conditions:

* 1. I will discretize the equation as follows:

It is important to note the order of error in this approximation:

The discretization creates a linear system which has a numerical solution at a finite number of close-together elements within my domain. and should be very small, minimizing error O.

* 1. I will compare 2 numerical methods for solving the problem.
     1. Gauss-Seidel method

Using initial guesses for u’s and known boundary conditions, I perform iterations until my solution converges within an acceptable amount of error per continuing iteration. A pseudocode is shown as follows.

* + 1. Successive Overrelaxation
  1. I will use my HP laptop to solve the problem. The technical specifications of my laptop are as follows:

1. **Results** (include graphs and comments)
   1. Specifications of parameters used in simulations
   2. Evaluate the effect of number of points used for discretization
   3. Perform grid convergence study
   4. Evaluate the effect of diffusive CFL\*
   5. Comparison of results with expected theoretical behavior
   6. Verify the order of spatial accuracy of discretization