For boundary Conditions Given

Effect of gamma

1. SOR N=150
   1. Gamma=pi
      1. timedoc = 14.7931
      2. Iterations = 11130
   2. Gamma=-pi
      1. timedoc = 0.2304
      2. iterations= 200
   3. Gamma=0
      1. timedoc =2.4554
      2. iterations= 2080

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**Numerical Solution of the 2D Helmholtz Equation**

**MECE 5397: Scientific Computing for Mechanical Engineers**

**Professors:**

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**Cullen College of Engineering | University of Houston**

# Abstract

# Mathematical statement of the project

The task is to derive a numerical solution of the 2D Helmholtz equation over a rectangular region. The details of the project are shown below. Dirichlet boundary conditions have been prescribed on the boundaries 1, 2 and 4, while a Neumann boundary condition is applied on the bottom edge. The wave constant in the Helmholtz equation is given as. In order to approximate a solution to this problem, two numerial solver have been used: the Gauss-Seidel method and the Successive Relaxation method.

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