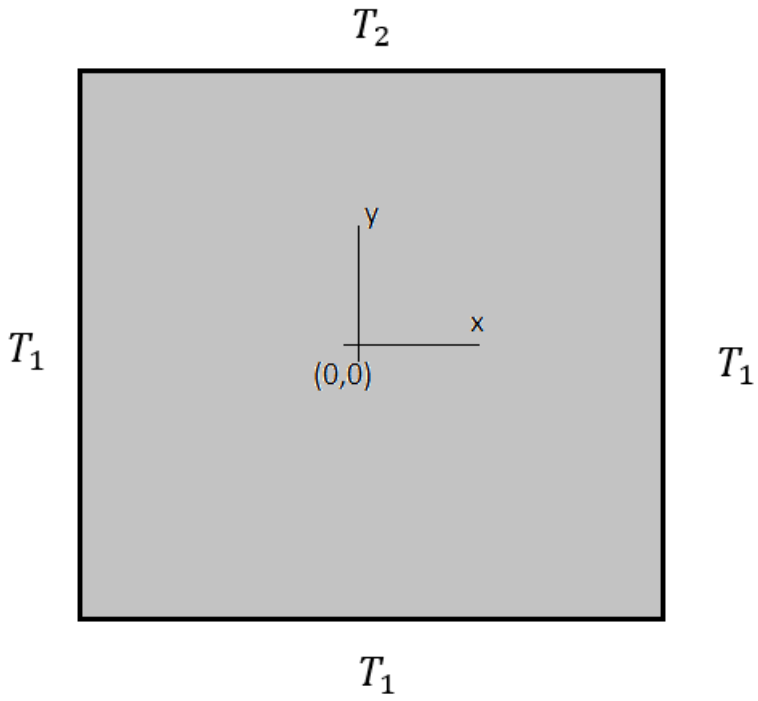
CO21BTECH11002

Aayush Kumar

2D-Diffusion Problem

Objective:

To find temperature variation in a 2D sheet;



Methods used:

1) LU Decomposition
2) Gauss Seidel
3) Conjugate Gradient

Input:

Number of divisions in sheet: 100

Length of each division: 1

Value of constant (c) in γ : 40

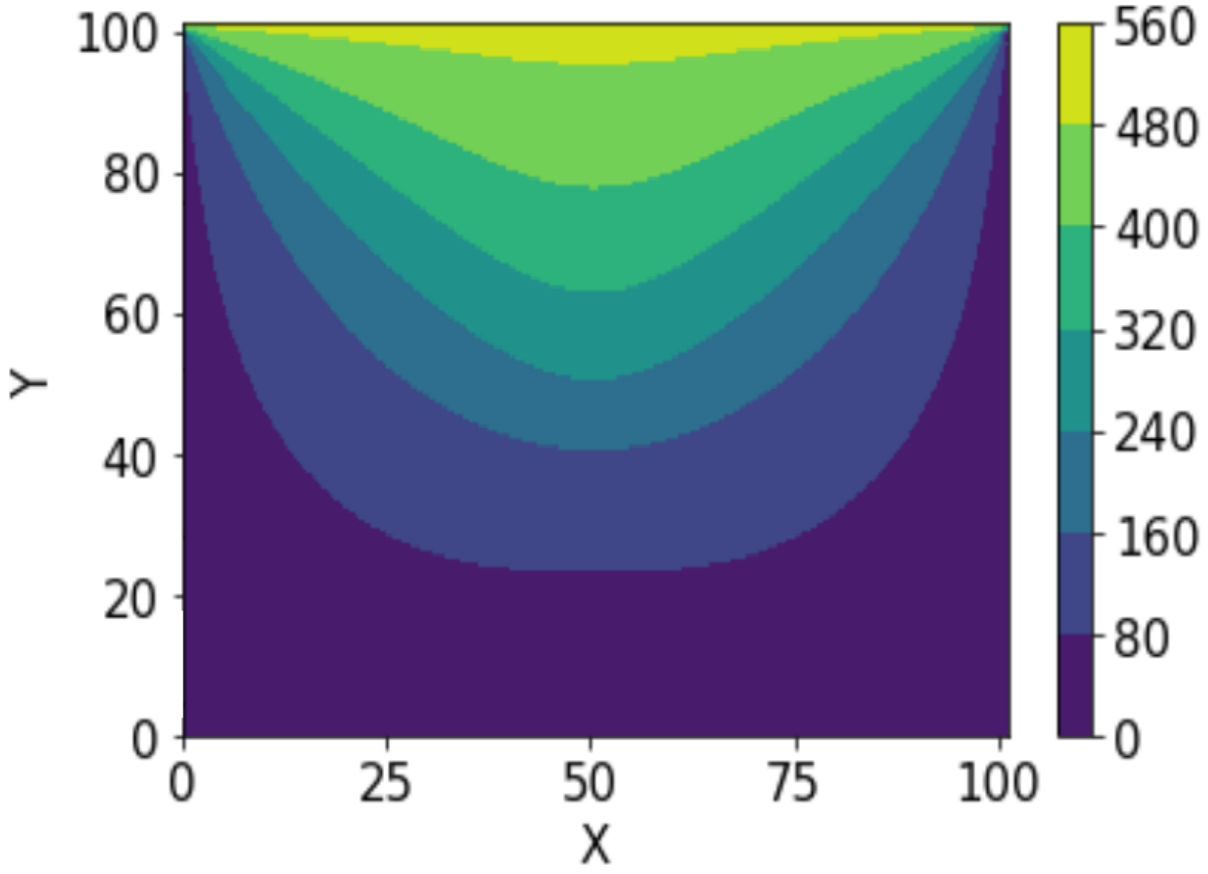
T_1: 50

T_2: 500

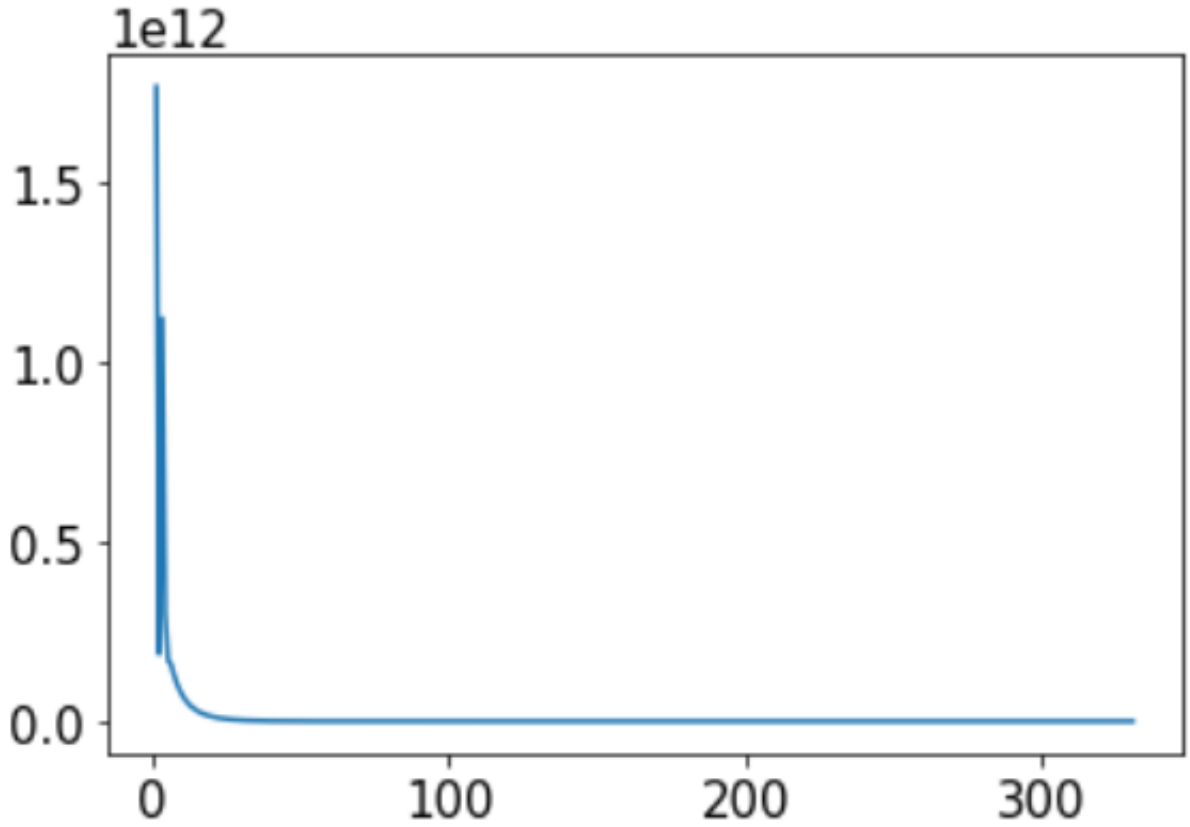
$(\gamma \equiv x^2 + y^2 + c)$

Output:

Temperature variation across the sheet:

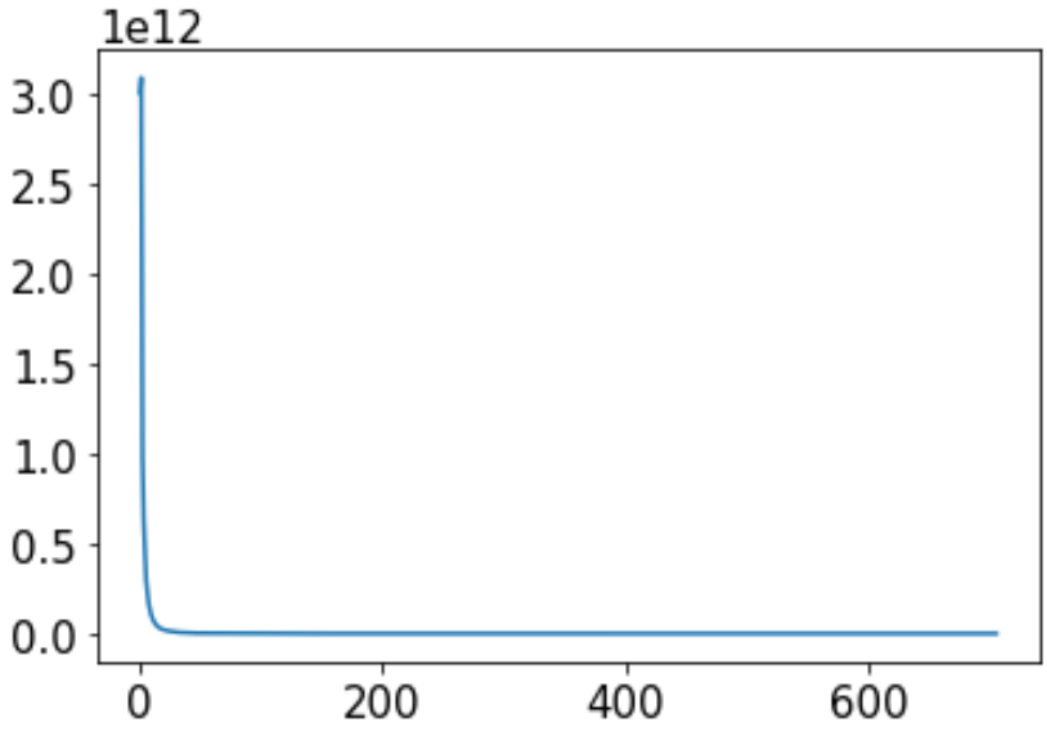


Error variation in Gauss Seidel Method:



Number of iterations in Gauss Seidel: 331

Error Variation in Conjugate Gradient Method:



Number of iterations in Conjugate Gradient Method: 705

Time Taken:

LU Decomposition: 47m 23.549s

Gauss Seidel: 4m 32.596s

Conjugate Gradient: 4m 14.312s