Advance Numerical Technique Laboratory

Lab 8

Q.1 Solve linear BVP and implement Spline Interpolation Method

y'' + 2y' + y = 30x

y(0) = 0, y(1) = 0

h = 1/2

Solution :-

```
w =

         0   -1.7045         0
   13.5124   13.1405   15.7438


x =

         0    0.5000    1.0000
```

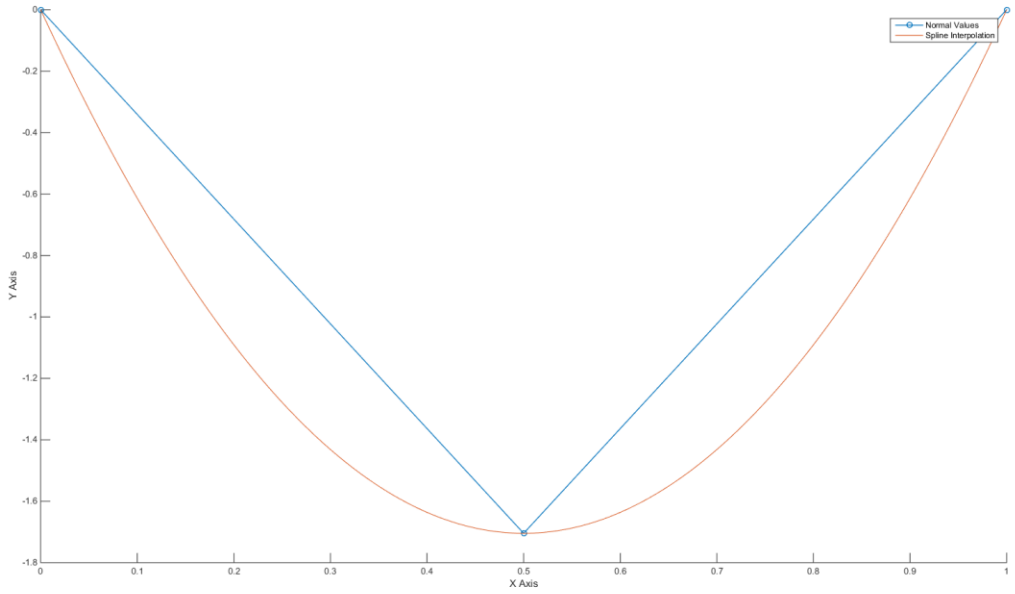

Fig1: Final Plot

Q.2 Solve Possion's Equation using 5-Point Method and Gauss Seidal Method

d2u/dx2 + d2u/dy2 = x^2 + y^2

u(x ,y) = 0 for 0 <= x,y <= 1

h = 1/4

Solution:-

```
u =

ans =

         0         0         0         0         0
         0   -0.0142   -0.0245   -0.0254         0
         0   -0.0245   -0.0391   -0.0379         0
         0   -0.0254   -0.0379   -0.0365         0
         0         0         0         0         0
```

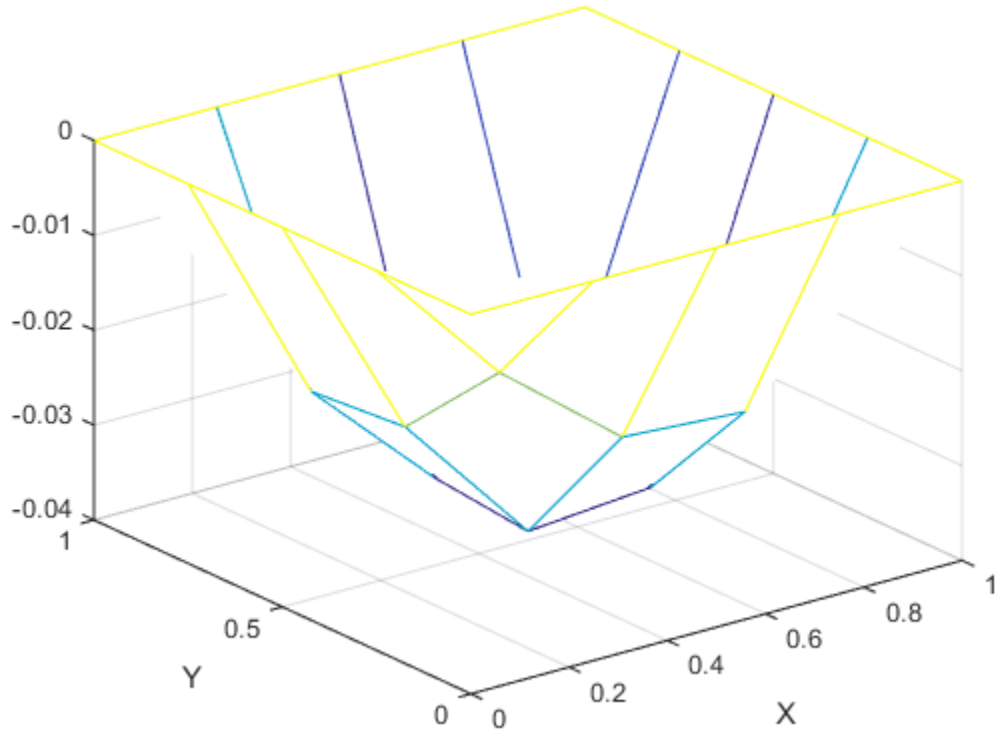

Fig2: Plot