**Numerical Analysis**

**Programming Assignment 2**

**Question 1 and 2:**

Using code written for question 1 for the system in question 2, the following results were achieved:

Solution of the system is:

x1 = -0.634

x2 = -0.301

x3 = -0.296

x4 = 0.543

in 17 iterations.

**Question 3 and 4:**

Using code written for question 3 for the system in question 4, the following results were achieved:

Solution of the system is:

x1 = -0.634

x2 = -0.301

x3 = -0.296

x4 = 0.543

in 11 iterations.

Gauss Seidel method got to the solution in 6 less iterations than Jacobi method.

**Question 5:**

AX = b

A = Coefficient matrix

= [ -1 0 0 0.707106781186548 1 0 0 0 ]

[ 0 -1 0 0.707106781186548 0 0 0 0 ]

[ 0 0 -1 0 0 0 0.500000000000000 0 ]

[ 0 0 0 -0.707106781186548 0 -1 -0.500000000000000 0 ]

[ 0 0 0 0 -1 0 0 1 ]

[ 0 0 0 0 0 1 0 0 ]

[ 0 0 0 -0.707106781186548 0 0 0.866025403784439 0 ]

[ 0 0 0 0 0 0 -0.866025403784439 -1 ]

X = Variable array

= [ F1 ]

[ F2 ]

[ F3 ]

[ f1 ]

[ f2 ]

[ f3 ]

[ f4 ]

[ f5 ]

b = Right hand side values’ array

= [ 0 ]

[ 0 ]

[ 0 ]

[ 0 ]

[ 0 ]

[10000 ]

[ 0 ]

[ 0 ]



Solution of the system is:

F1 = -47329.095

F2 = -23660.231

F3 = -13660.211

f1 = 33460.641

f2 = 23659.761

f3 = 9999.999

f4 = 27320.504

f5 = -23660.268

in 12 iterations.