Assignment-3

Problem-1: Solve the following set of equations by writing a code for the **Gauss-Seidel method** and **Jacobi iteration method**.

$$\begin{bmatrix} 12 & 3 & -5 \\ 1 & 5 & 3 \\ 3 & 7 & 13 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ 28 \\ 76 \end{bmatrix}$$

Print results at each step of iteration till the last coverged result. Exact solution for this case is

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \\ 4 \end{bmatrix}$$

Note that Jacobi iteration method is very similar to the Gauss-Seidel method with a little difference. Rather than using the latest available x's, you have to compute a set of new x's on the basis of a set of old x's at every iteration. This new set will be used in the next iteration to compute another set of x's. Refer to the following figure. The Left and the right sides of the figure explain the Gauss-Seidel and the Jacobi methods respectively.