In[1]:=
```
GaussSeidel[a0_, b0_, x0_, e0_, m0_] :=
 Module[{},
  A = a0;
  B = b0;
  X = x0;
  n = Length[X];
  e = N[e0];
  m = N[m0];
  k = 0;
  X1 = X;
  Print["Given System is : " MatrixForm[A], "X = ", MatrixForm[B]];
  output = {{k, NumberForm[X1, 10]}};
  While[k < m,
   For[i = 1, i ≤ n, i++,
    X1[[i]] = N[(1 / A[[i, i]]) * (B[[i]] -
          Sum[A[[i, j]] * X1[[j]], {j, 1, i - 1}] - Sum[A[[i, j]] * X[[j]], {j, i + 1, n}])];
   ];
   output = Append[output, {k + 1, NumberForm[X1, 10]}];
   If[Norm[X1 - X] < e, Print["Condition Exists at ", k + 1, "."]; Break[]];
   X = X1;
   k++
  ];
  Print[NumberForm[TableForm[output, TableHeadings → {None, {"k", "X[]"}}], 16]];
  Print["X =  ", NumberForm[X1, 10]];
 ]
A = {{5, 1, 2}, {-3, 9, 4}, {1, 2, -7}};
B = {10, -14, -33};
X = {0, 0, 0};
GaussSeidel[A, B, X, 10^(-5), 25]
```

Given System is : $\begin{pmatrix} 5 & 1 & 2 \\ -3 & 9 & 4 \\ 1 & 2 & -7 \end{pmatrix} X = \begin{pmatrix} 10 \\ -14 \\ -33 \end{pmatrix}$

Condition Exists at 14.

k	X[]
0	{0, 0, 0}
1	{2., -0.8888888889, 4.746031746}
2	{0.2793650794, -3.571781305, 3.733686067}
3	{1.220881834, -2.808010974, 4.086408555}
4	{0.9270387727, -3.062724211, 3.971655764}
5	{1.023882537, -2.979441716, 4.009285586}
6	{0.9921741088, -3.006735558, 3.99695757}
7	{1.002564083, -2.997793115, 4.000996836}
8	{0.9991598884, -3.000723076, 3.999673391}
9	{1.000275259, -2.999763088, 4.000107012}
10	{0.9999098127, -3.000077623, 3.999964938}
11	{1.000029549, -2.999974567, 4.000011488}
12	{0.9999903183, -3.000008333, 3.999996236}
13	{1.000003172, -2.99999727, 4.000001233}
14	{0.9999989607, -3.000000895, 3.999999596}

X = {0.9999989607, -3.000000895, 3.999999596}