Convolutional Code

The code indicates that for any general matrix, Gauss-Seidel iteration performs faster than Jacobi iteration. Gauss-Seidel requires fewer iterations than Jacobi.

For this decoding portion in which the goal is to decode (11, 01, 01, 01, 00, 00, 10, 01, 00, 00, 01, 11, 11, 01, 10, 11, 00) into (1, 0, 1, 1, 1, 0, 1, 1, 1, 0, 0, 0, 1, 0) with error tolerance of , it takes 10 iterations for Jacobi and 2 iterations for Gauss-Seidel. If the input Y stream is of length 100 of arbitrary 1s and 0s in any given order, it takes 51 iterations for Jacobi and 2 iterations for Gauss-Seidel.

The code still reveals that Gauss-Seidel performs faster than Jacobi iteration. However, it indicates that Gauss-Seidel always converges to 2 iterations only in in realm of decoding, despite the length of the initial stream. Thus, the length does not affect the number of iterations for Gauss-Seidel. On the other hand, the length of the initial stream does affect the number of iterations required for Jacobi. The longer the stream, the more iterations Jacobi needs to complete the process Ax = b.