1. Jacobi method

$$x^{(k+1)} = \underbrace{D^{-1}}_{n \cdot n}\Big(\underbrace{b - (L+U)}_{n}\underbrace{x^{k}}_{n \cdot n}\Big)$$

$2n^2 + 3n$ per iteration

for n rows so

$2n^3 + 3n^2$

Gauss Siedel method

$$x_i^{(k+1)} = \underbrace{\frac{1}{a_{ii}}}_{n} \left(b_i - \sum_{j=1}^{i-1} a_{ij} x_j^{(k+1)} - \sum_{j=i+1}^{n} a_{ij} x_j^{(k)} \right)$$

n $\quad n(n-(j-i))$ $\quad n(n-(i+1))$

$n^2 \cancel{+ni} - nj + n^2 - \cancel{ni} + n$

$n(2n^2 + 3n - nj)$ $\quad 2n^2 + 2n - nj$

$2n^3 + 3n^2 - n^2 j$

Choelsky Decomp

$$L_{ii} = \sqrt{A_{ii} - \sum_{k=1}^{i-1} L^2_{ik}}$$

$1 \qquad (i-1) \qquad 1$

$n(i-1)$

$$L_{ij} = \frac{1}{L_{ii}}\left(A_{ji} - \sum_{k=1}^{i-1} L_{jk} L_{ik}\right)$$

n^2

$1 \qquad 1 \qquad n \qquad 1$

$$n^3 + ni - n + 3$$