Gaussian elimination algorithm

for $k = 1, \ldots, n - 1$ do
  if $a_{kk} = 0$ then
    quit
  else
    for $i = k + 1, \ldots, n$ do
      $\eta := a_{ik}/a_{kk}$
      $a_{ik} = \eta$
      for $j = k + 1, \ldots, n$
        $a_{ij} := a_{ij} - \eta \, a_{kj}$
      end for
    end for
  end if
end for

Forward substitution algorithm

for $i = 1, \ldots, n$ do
 $y_i := b_i$
 for $j = 1, \ldots, i - 1$ do
  $y_i := y_i - \ell_{ij}\, y_j$
 end for
 $y_i := y_i / \ell_{ii}$
end for

Back substitution algorithm

for $i = n, \ldots, 1$ do
 $x_i := y_i$
 for $j = i + 1, \ldots, n$ do
  $x_i := x_i - u_{ij}\, x_j$
 end for
 $x_i := x_i / u_{ii}.$
end for

Cholesky Decomposition (Column version)

for $\quad k = 1, 2, \ldots, n$ do

$$a_{kk} := (a_{kk} - \sum_{p=1}^{k-1} a_{kp}^2)^{1/2}$$

for $\ i = k + 1, \ldots, n$ do

$$a_{ik} := (a_{ik} - \sum_{p=1}^{k-1} a_{ip} a_{kp})/a_{kk}$$

end for

end for

$$A = \begin{bmatrix} a_{11} & 0 & a_{13} & 0 & 0 & 0 \\ 0 & a_{22} & 0 & 0 & 0 & a_{26} \\ a_{31} & 0 & a_{33} & a_{34} & a_{35} & 0 \\ 0 & 0 & a_{43} & a_{44} & 0 & a_{46} \\ 0 & 0 & a_{53} & 0 & a_{55} & 0 \\ 0 & a_{62} & 0 & a_{64} & 0 & a_{66} \end{bmatrix}$$

	memory
full matrix	36
band matrix	34
profile matrix	24