

$$\begin{aligned}
 \mathbf{M}_{3 \times 3} = \mathbf{X}^T \mathbf{X} = & \begin{pmatrix} 18 & 42 & 60 & 31 \\ 22 & 27 & 25 & 29 \\ 108 & 125 & 117 & 132 \end{pmatrix} \begin{pmatrix} 6649 & 3929 & 18306 \end{pmatrix} \\
 & \begin{pmatrix} 18 & 22 \rightarrow 108 \\ 42 & 27 \rightarrow 125 \\ 60 & 25 \rightarrow 117 \\ 31 & 29 \rightarrow 132 \end{pmatrix} \\
 & \begin{matrix} 108 + 18 \\ 125 + 42 \\ 117 + 60 \\ 132 + 31 \end{matrix}
 \end{aligned}$$