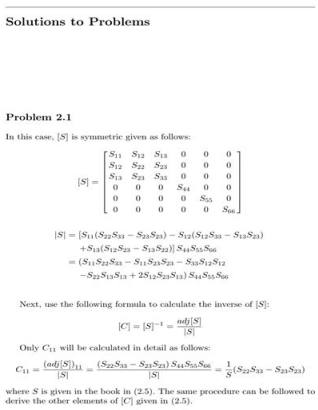

Solutions to Problems

Problem 2.1

In this case, $[S]$ is symmetric given as follows:

$$[S] = \begin{bmatrix} S_{11} & S_{12} & S_{13} & 0 & 0 & 0 \\ S_{12} & S_{22} & S_{23} & 0 & 0 & 0 \\ S_{13} & S_{23} & S_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & S_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & S_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & S_{66} \end{bmatrix}$$

$$\begin{aligned} |S| &= [S_{11}(S_{22}S_{33} - S_{23}S_{23}) - S_{12}(S_{12}S_{33} - S_{13}S_{23}) \\ &\quad + S_{13}(S_{12}S_{23} - S_{13}S_{22})]\, S_{44}S_{55}S_{66} \\ &= (S_{11}S_{22}S_{33} - S_{11}S_{23}S_{23} - S_{33}S_{12}S_{12} \\ &\quad - S_{22}S_{13}S_{13} + 2S_{12}S_{23}S_{13})\, S_{44}S_{55}S_{66} \end{aligned}$$

Next, use the following formula to calculate the inverse of $[S]$:

$$[C] = [S]^{-1} = \frac{adj[S]}{|S|}$$

Only C_{11} will be calculated in detail as follows:

$$C_{11} = \frac{(adj[S])_{11}}{|S|} = \frac{(S_{22}S_{33} - S_{23}S_{23})\, S_{44}S_{55}S_{66}}{|S|} = \frac{1}{S}(S_{22}S_{33} - S_{23}S_{23})$$

where S is given in the book in (2.5). The same procedure can be followed to derive the other elements of $[C]$ given in (2.5).