STATS202A, Statistics Programming - Homework# 1

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Sweep Operator is a simpler way of calculating various matrix related operations like inverse, determinant etc. In terms in complexity, sweep operator fares much better as compared to other operations.
The operator works as follows:

$$\begin{aligned} b_{ij} &= a_{ij} - \frac{a_{ik}a_{kj}}{a_{kk}} \\ b_{kj} &= \frac{a_{kj}}{a_{kk}} \\ b_{ik} &= -\frac{a_{ik}}{a_{kk}} \\ b_{kk} &= frac1a_{kk} \end{aligned} \tag{1}$$

$$\begin{bmatrix} x_u(l) \\ y_u(l) \end{bmatrix} = \begin{bmatrix} a_1 & 0 \\ 0 & a_2 \end{bmatrix} \begin{bmatrix} x_u^{k^\star}(l) \\ y_u^{k^\star}(l) \end{bmatrix} + \begin{bmatrix} b_1 \\ b_2 \end{bmatrix}, i^{'} \leq l \leq j^{'}.\ a_1,\ a_2,\ b_1,\ b_2$$