- Var of a vector corresponds to a variance-covariance matrix.

Example: vector $y^* = \begin{bmatrix} y_1^* \\ y_2^* \\ \vdots \\ y_k^* \end{bmatrix}$

$$P = var(y^*) = \begin{bmatrix} var(y_1^*) & cov(y_1^*, y_2^*) & cov(y_1^*, y_3^*) & \cdots & cov(y_1^*, y_k^*) \\ cov(y_2^*, y_1^*) & var(y_2^*) & cov(y_2^*, y_3^*) & \cdots & cov(y_2^*, y_k^*) \\ \vdots & & & & \\ cov(y_k^*, y_1^*) & cov(y_k^*, y_2^*) & \cdots & \cdots & var(y_k^*) \end{bmatrix}$$

- symmetric matrix
- it has k rows and k columns

- $$G = cov(u, (y^*)^T) = \begin{bmatrix} cov(u, y_1^*) \\ cov(u, y_2^*) \\ \vdots \\ cov(u, y_k^*) \end{bmatrix}$$

- $R = \sigma_u^2 + b^T \cdot P \cdot b + 2\, b^T \cdot G$

- Minimization: $\underbrace{\frac{\partial R}{\partial b}}_{\text{Gradient}} = \emptyset = \begin{bmatrix} \frac{\partial R}{\partial b_1} \\ \frac{\partial R}{\partial b_k} \\ \vdots \end{bmatrix}$