

- $\text{var}(u)$: variance-covariance matrix

$$G = \text{var}(u) = \begin{bmatrix} \text{var}(u_1) & \text{cov}(u_1, u_2) & \text{cov}(u_1, u_3) & \dots \\ \text{cov}(u_2, u_1) & \text{var}(u_2) & \text{cov}(u_2, u_3) & \dots \\ \vdots & \vdots & \vdots & \ddots \end{bmatrix}$$

where $u = \begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_{27} \end{bmatrix}$

• $\text{var}(e) = R = \begin{bmatrix} \text{var}(e_1) & \text{cov}(e_1, e_2) & \dots \\ \text{cov}(e_2, e_1) & \text{var}(e_2) & \dots \\ \vdots & \vdots & \ddots \end{bmatrix}$

$$\text{var}(e_1) = \text{var}(e_2) = \dots = \sigma_e^2$$

$$\text{cov}(e_1, e_2) = \text{cov}(e_1, e_3) = \dots = 0$$

$$\Rightarrow R = \begin{bmatrix} \sigma_e^2 & 0 & 0 & \dots & 0 \\ 0 & \sigma_e^2 & & & \\ \vdots & & \ddots & & \\ 0 & & & \sigma_e^2 & \\ \vdots & & & & \ddots \end{bmatrix} = I \cdot \sigma_e^2$$