Meaning of $var(x)$, if x is a scalar random variable

For a vector u of random variables:

$var(u)$ is a $q \times q$ variance - covariance matrix

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

What are the single components of matrix G:

$(G)_{11} = var(u_1) = 1 \cdot \sigma_u^2$ (because animal 1 has unknown parents and is not inbred)

genetic additive variance

$(G)_{12} = cov(u_1, u_2)$
$= 0$

Animal 2 has unknown parents, hence animals 1 and 2 are assumed to be unrelated

$(G)_{13} = cov(u_1, u_3) = cov\left(u_1, \left[\frac{1}{2}(u_1 + u_2) + m_3\right]\right)$

decomposition u_3 into bre