

$$\text{var}(\{\mathbf{u}^t \mathbf{x}_i \mid i \in \{1, \dots, n\}\}) = \frac{1}{n} \sum_{i=1}^n (\mathbf{u}^t \mathbf{x}_i - \mathbf{u}^t(\bar{\mathbf{x}}))^2$$