

$$\begin{aligned}
 e &= \int_{-\infty}^{\infty} (x - \hat{x})^2 f_X(x) dx \\
 &= \sum_{k=1}^K \int_{b_k}^{b_{k+1}} (x - \mu_k)^2 f_X(x) dx
 \end{aligned}$$

