A107270053 黃貝高

$$E(\hat{\theta}_1) = E\left(\frac{\sum(x_i - \bar{x})^2}{n}\right)$$

$$= \frac{1}{n}\sum(\sum x_i^2 - n\bar{x}^2)$$

$$= \frac{1}{n}(n\sigma^2 + n\mu^2 - \sigma^2 - n\mu^2) = \frac{n-1}{n}\sigma^2 \to \text{偏誤估計量}$$

$$E(\hat{\theta}_2) = \sum\left(\frac{\sum(x_i - \bar{x})^2}{n-1}\right) = \frac{1}{n-1}E(\sum x_i^2 - n\bar{x}^2)$$

$$= \frac{1}{n-1}(n\sigma^2 + n\mu^2 - \sigma^2 - n\mu^2) = \sigma^2$$

$$\to \text{不偏估計量}$$