

$$\begin{aligned}\text{Cov}(X, Y) &= E\{(X - \mu)(Y - \nu)\} \\ &= E\{XY - X\nu - Y\mu + \mu\nu\} \\ &= E(XY) - \nu E(X) - \mu E(Y) + \mu\nu \\ &= E(XY) - \mu\nu \\ &= E(XY) - E(X)E(Y)\end{aligned}$$

