

$$\begin{aligned}\text{var}(X + Y) &= E(X + Y)^2 - [E(X + Y)]^2 \\ &= [EX^2 + 2E(XY) + EY^2] - [(EX)^2 + 2(EX)(EY) + (EY)^2] \\ &= \text{var}X + \text{var}Y + 2\text{cov}(X, Y)\end{aligned}$$