

Problem 107

$$C_1 = X + Y$$

$$C_2 = X + 1.2 \cdot Y$$

$$\begin{aligned} \text{cov}(C_1, C_2) &= \text{cov}(X+Y, X+1.2 \cdot Y) \\ &= \text{cov}(X, X) + 1.2 \cdot \text{cov}(X, Y) + \text{cov}(Y, X) + 1.2 \cdot \text{cov}(Y, Y) \\ &= V(X) + 2.2 \cdot \text{cov}(X, Y) + V(Y) \cdot 1.2 \end{aligned}$$

$$\begin{aligned} E(X^2) - E(X)^2 \\ 27.4 - 5^2 = 2.4 \end{aligned}$$

$$\begin{aligned} E(Y^2) - E(Y)^2 \\ 51.4 - 7^2 = 2.4 \end{aligned}$$

$$V(X+Y) = V(X) + V(Y) + 2 \cdot \text{cov}(X, Y)$$

$$8 = 2.4 + 2.4 + 2 \cdot \text{cov}(X, Y)$$

$$1.6 = \text{cov}(X, Y)$$

$$\begin{aligned} \text{cov}(C_1, C_2) &= 2.4 + 2.2(1.6) + 1.2(2.4) \\ &= 8.8 \end{aligned}$$

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