Problem Set 12

Problem 1

(a) $2N \cdot \frac{1}{2} + 0 \cdot \frac{1}{2} = N$

$(2N - N) \cdot \frac{1}{2} + (0 - N) \cdot \frac{1}{2} = N^2$

(b) $R = R_1 + \cdots + R_N$

$Ex(R) = Ex(R_1) + \cdots + Ex(R_N)$

$= N$ *

$Var(R) = Var(R_1) + \cdots + Var(R_N)$

$= N$

(c) Second strategy is less Risky.

(d) $3.5 = Ex$

$(1 - 3.5)^2 \frac{1}{6} + (2 - 3.5)^2 \frac{1}{6} + (3 - 3.5)^2 \frac{1}{6}$

$+ (4 - 3.5)^2 \frac{1}{6} + (5 - 3.5)^2 \frac{1}{6} + (6 - 3.5)^2 \frac{1}{6}$

(e) $Ex = (1 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3) \frac{1}{6}$

$Var = (1^3 - \mu)^2 \frac{1}{6} + (2^3 - \mu)^2 \frac{1}{6} + (3^3 - 4)^2 \frac{1}{6}$

$+ \cdots + (6 - \mu)^2 \frac{1}{6}$

Problem 2

(a) $R = R_1 + R_2 + \cdots + R_7$

$E_x(R) = \frac{7}{8} \cdot 7$

(b) Sometimes $E_x(R)$ has to $\overset{15}{\cancel{8}}\ R \rightarrow \overset{3}{R} = 7$

Problem 3

(a) $1 \cdot 2/3 + 2 \cdot 1/3 = 4/3$

(b) $\frac{1}{1/6} = 6 \rightarrow 5 = 6 - 1$

(c) $(3.5)^2$

(d) $\frac{1}{2} \cdot 4/3 + 1/3 \cdot 5 + \frac{1}{6} \cdot 3.5^2$

Problem 4

$Pr\{\ \geq th\} \leq 0.05 \iff CDF(th) \geq 0.95$

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