UE5-Ex14 A

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$X = \{1, 2, 3, 4, 5, 6\}$ $\quad P[X = i] = \frac{1}{6}, \; 1 \leq i \leq 6$

$A = \{2, 4, 6\}$ $\quad P[A = i] = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

$Y_i = \begin{cases} 1: & X_i \in A \\ 0: & X_i \notin A \end{cases} \Rightarrow$ $\quad E[Y_i] = X_2 \cdot P[X = X_2] + X_4 \cdot P[X = X_4] + X_6 \cdot P[X = X_6]$

$\sigma^2 = \frac{1}{n-1} \sum_{i=1}^{n} (Y_i - \mu)^2$ $\quad E[Y_i] = 1 \cdot \frac{1}{6} + 1 \cdot \frac{1}{6} + 1 \cdot \frac{1}{6}$

$\sigma^2 = \frac{1}{4} \cdot \frac{1}{2} + \frac{1}{4} \cdot \frac{1}{2} = \frac{2}{8}$ $\quad E[Y_i] = \frac{3}{6} = \frac{1}{2} \Rightarrow \mu$

$\sigma^2 = \frac{1}{4}$