

§15 WORKSHEET 9 2011 – 2012

EXERCISES REGARDING APPROXIMATING BINOMIAL PROBABILITY WITH A DIFFERENT PMF OR PDF

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Exercise 15.1. Let $X \sim \text{Bin}(x, 5, \frac{1}{2})$.

- (1) Evaluate $Pr(X \in \{1, 2\})$.
- (2) Approximate $Pr(X \in \{1, 2\})$ with $X_1 \sim \text{Pois}(x_1, \lambda = \frac{5}{2})$.
- (3) Approximate $Pr(X \in \{1, 2\})$ with $X_2 \sim \text{Nor}(x_2, \mu = \frac{5}{2}, \sigma = \sqrt{\frac{5}{4}})$.

Exercise 15.2. Let $X \sim \text{Bin}(x, 5, \frac{1}{10})$.

- (1) Evaluate $Pr(X \in \{1, 2\})$.
- (2) Approximate $Pr(X \in \{1, 2\})$ with $X_3 \sim \text{Pois}(x_3, \lambda = \frac{1}{2})$.
- (3) Approximate $Pr(X \in \{1, 2\})$ with $X_4 \sim \text{Nor}(x_4, \mu = \frac{1}{2}, \sigma = \sqrt{\frac{9}{20}})$.

Exercise 15.3. Let $X \sim \text{Bin}(x, 20, \frac{1}{4})$.

- (1) Evaluate $Pr(X \in \{1, 2\})$.
- (2) Approximate $Pr(X \in \{1, 2\})$ with $X_5 \sim \text{Pois}(x_5, \lambda = 5)$.
- (3) Approximate $Pr(X \in \{1, 2\})$ with $X_6 \sim \text{Nor}(x_6, \mu = 5, \sigma = \sqrt{\frac{15}{4}})$.

Exercise 15.4. Let $X \sim \text{Bin}(x, 20, \frac{3}{4})$.

- (1) Evaluate $Pr(X \in \{1, 2\})$.
- (2) Approximate $Pr(X \in \{1, 2\})$ with $X_7 \sim \text{Pois}(x_7, \lambda = 15)$.
- (3) Approximate $Pr(X \in \{1, 2\})$ with $X_8 \sim \text{Nor}(x_8, \mu = 15, \sigma = \sqrt{\frac{15}{4}})$.

Exercise 15.5. Let $X \sim \text{Bin}(x, 50, \frac{1}{20})$. Approximate $Pr(X \in \{5, 10\})$ with and appropriate Poisson or Normal distribution.

Exercise 15.6. Let $X \sim \text{Bin}(x, 50, \frac{1}{2})$. Approximate $Pr(X \in \{5, 10\})$ with and appropriate Poisson or Normal distribution.