HW 4 Solution

1. $P(X \le 7) = \sum_{x=0}^{7} \binom{20}{x} 0.48^x (1-0.48)^{20-x} = 0.1739185$

$= \text{binCDF}(7, 20, 0.48)$

2a) $P(X \le 10) = \text{binCDF}(10, 13, 0.9)$

$= \sum_{x=0}^{10} \binom{13}{x} 0.9^x (1-0.9)^{13-x} = 0.1338828$

b) $P(X \ge 10) = 1 - \text{binCDF}(9, 13, 0.9)$

$= \sum_{x=10}^{13} \binom{13}{x} 0.9^x (1-0.9)^{13-x} = 0.8661172$

c) $P(X = 10) = \text{binPDF}(10, 13, 0.9)$

$= \binom{13}{10} 0.9^{10} (1-0.9)^3 = 0.09972203$

3) $P(X \ge 2) = 1 - \text{binCDF}(1, 10, 0.005)$

$= \sum_{x=1}^{10} \binom{10}{x} 0.005^x (1-0.005)^{10-x} = 0.00109539$

4a) $P(X \ge 2) = 1 - \text{binCDF}(1, 15, 0.05)$

$= \sum_{x=1}^{15} \binom{15}{x} 0.05^x (1-0.05)^{15-x} = 0.1709525$

b) $P(X = 0) = \text{binPDF}(0, 15, 0.05)$

$= \binom{15}{0} 0.05^0 (1-0.05)^{15} = 0.4632912$

5a) $P(X \ge 3) = 1 - \text{binCDF}(2, 5, 0.25) = 0.1035156$

b) $X \sim \text{Bin}(1, 1, 0.25) = 0.25^1 (0.75)^0 = 0.25$