

# SOLUTIONS

## In-class Assignment 5- Binomial Probability Distribution

Dawson College

Introduction to Statistics (201-922-DW-S01)

Date: October 9th, 2015

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### Question 1.

- Give  $n$ ,  $p$ ,  $q$  in the experiment of flipping a coin 9 times with  $x$  = number of tails observed.
- What is the probability that one observes 5 tails when flipping a coin 9 times?
- What is the probability of observing **at most** 8 tails?

### Question 2.

A restaurant sells sandwiches and notes that 70% of people order chicken sandwiches and 30% order vegetarian sandwiches.

- What is the probability of the restaurant selling at least 5 vegetarian sandwiches to the next 7 people?
- Give  $n$ ,  $p$ ,  $q$  in the binomial experiment described in a.

### Question 1 SOLUTIONS

a.  $n = 9$     $p = 0.5$     $q = 0.5$

b.  ${}^9C_5 (0.5)^5 (0.5)^4$

c. FIRST we compute  $P(X=9)$

$$P(X=9) = {}^9C_9 (0.5)^9 (0.5)^0 = 0.002$$

$$\text{so } P(X \leq 8) = 1 - 0.002 = \underline{0.998}$$

### QUESTION 2 SOLUTIONS

$$\begin{aligned} \text{a. } P(X \geq 5) &= P(X=5) + P(X=6) + P(X=7) \\ &= {}^7C_5 (0.3)^5 (0.7)^2 + {}^7C_6 (0.3)^6 (0.7)^1 + {}^7C_7 (0.3)^7 (0.7)^0 \\ &= 0.025 \quad + \quad 0.00357 \quad + \quad 0.0002187 \\ &= \underline{0.0288} \end{aligned}$$

b.  $n = 7$     $p = 0.3$     $q = 0.7$