

DISCRETE RANDOM VARIABLES: PRACTICE 2: BINOMIAL DISTRIBUTION*

Susan Dean
Barbara Illowsky, Ph.D.

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Abstract

This module provides a practice of Binomial Distribution as a part of Collaborative Statistics collection (col10522) by Barbara Illowsky and Susan Dean.

1 Student Learning Outcomes

- The student will practice constructing Binomial Distributions.

2 Given

The Higher Education Research Institute at UCLA surveyed more than 263,000 incoming freshmen from 385 colleges. 36.7% of first-generation college students expected to work fulltime while in college. (*Source: Eric Hoover, The Chronicle of Higher Education, 2/3/2006*). Suppose that you randomly pick 8 first-generation college freshmen from the survey. You are interested in the number that expects to work full-time while in college.

3 Interpret the Data

Exercise 1

In words, define the random Variable X .

(Solution on p. 3.)

Exercise 2

$X \sim$ _____

(Solution on p. 3.)

Exercise 3

What values does X take on?

(Solution on p. 3.)

Exercise 4

Construct the probability distribution function (PDF) for X .

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x	$P(X=x)$

Table 1

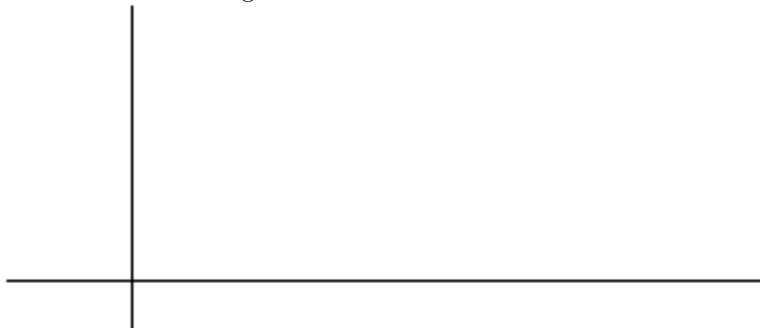
Exercise 5 *(Solution on p. 3.)*
 On average (μ), how many would you expect to answer yes?

Exercise 6 *(Solution on p. 3.)*
 What is the standard deviation (σ) ?

Exercise 7 *(Solution on p. 3.)*
 What is the probability that at most 5 of the freshmen expect to work full-time?

Exercise 8 *(Solution on p. 3.)*
 What is the probability that at least 2 of the freshmen expect to work full-time?

Exercise 9
 Construct a histogram or plot a line graph. Label the horizontal and vertical axes with words. Include numerical scaling.



Solutions to Exercises in this Module

Solution to Exercise 1 (p. 1)

X = the number that expect to work full-time.

Solution to Exercise 2 (p. 1)

$B(8, 0.367)$

Solution to Exercise 3 (p. 1)

0, 1, 2, 3, 4, 5, 6, 7, 8

Solution to Exercise 5 (p. 2)

2.94

Solution to Exercise 6 (p. 2)

1.36

Solution to Exercise 7 (p. 2)

0.9677

Solution to Exercise 8 (p. 2)

0.8547

