Discrete Random Variables: Practice 2: Binomial Distribution*

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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 construct the Binomial Distribution.

2 Given

The Higher Education Research Institute at UCLA collected data from 203,967 incoming first-time, full-time freshmen from 270 four-year colleges and universities in the U.S. 71.3% of those students replied that, yes, they believe that same-sex couples should have the right to legal marital status. (*Source: http://heri.ucla.edu/PDFs/pubs/TFS/Norms/Monographs/TheAmericanFreshman2011.pdf).*)

Suppose that you randomly pick 8 first-time, full-time freshmen from the survey. You are interested in the number that believes that same sex-couples should have the right to legal marital status

3 Interpret the Data

Exercise 1 *(Solution on p. 3.)*
In words, define the random Variable X.

Exercise 2 *(Solution on p. 3.)*
$X \sim$_____

Exercise 3 *(Solution on p. 3.)*
What values does the random variable X take on?

Exercise 4
Construct the probability distribution function (PDF).

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x	P(x)

Table 1

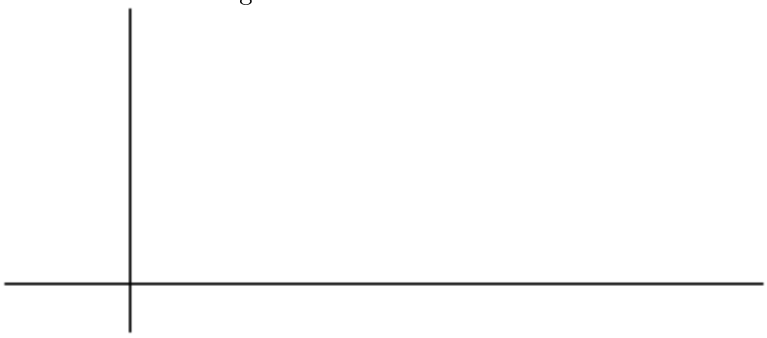
Exercise 5 *(Solution on p. 3.)*
On average (u), how many would you expect to answer yes?

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 reply "yes"?

Exercise 8 *(Solution on p. 3.)*
What is the probability that at least 2 of the freshmen reply "yes"?

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 (p. 1)
X = the number that reply "yes"
Solution to Exercise (p. 1)
$B(8,0.713)$
Solution to Exercise (p. 1)
0,1,2,3,4,5,6,7,8
Solution to Exercise (p. 2)
5.7
Solution to Exercise (p. 2)
1.28
Solution to Exercise (p. 2)
0.4151
Solution to Exercise (p. 2)
0.9990