COLLABORATIVE STATISTICS: DISCRETE RANDOM VARIABLES: PRACTICE 2; BINOMIAL DISTRIBUTION

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STUDENT LEARNING OUTCOMES:

- The student will practice constructing Binomial distributions.

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 full-time while in college. (Source: Eric Hoover, The Chronicle of Higher Education, 2/3/2006).

ORGANIZE THE DATA

Suppose that you randomly pick 8 college freshmen from the survey. You are interested in the number that expects to work full-time while in college.

1. In words, define the Random Variable X.

2. \( X \sim \) ________________

3. \( X \) takes on the values: __________________________
4. Construct the probability distribution function (PDF) for X.

<table>
<thead>
<tr>
<th>x</th>
<th>P(X=x)</th>
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5. On average (μ), how many would you expect to answer "yes"?

6. What is the standard deviation (σ)?
7. What is the probability that at most 5 of the freshmen expect to work full-time?

8. What is the probability that at least 2 of the freshmen expect to work full-time?

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