Classroom Examples – Alternatives to the One Proportion Test

Perform these hypothesis tests by using the binomial calculator to compute the *P*-value. Write up all 5 steps. Also, compute the *P*-value using the coin flip simulator in StatCrunch.

Computing *P*-value if $\hat{p} = \dfrac{x}{n}$ using the binomial distribution:

n is the sample size
p is the value in H_0

Left-tailed test: Find $P(X \leq \text{number of successes})$

Right-tailed test: Find $P(X \geq \text{number of successes})$

Two-tailed test: If $\hat{p} < p$ double the left-tailed *P*-value.

Otherwise double the right-tailed *P*-value.

Computing *P*-value if $\hat{p} = \dfrac{x}{n}$ using the coin-flip simulator:

p is the "Probability of heads"
n is the "Number of coins"

Left-tailed test: Tally the proportion that are $\leq x$
Right-tailed test: Tally the proportion that are $\geq x$
Two-tailed test: If $\hat{p} < p$ double the left-tailed *P*-value.

Otherwise double the right-tailed *P*-value.

1) A local buffet restaurant has many patrons that are senior citizens. The manager of the restaurant claims that more than 35% of her customers are senior citizens. A random sample of 50 diners revealed that 22 of them were senior citizens. At the 0.05 level of significance, test the manager's claim.

2) A federal publication claims that 60% of all 18- to 25-year olds have used alcohol in the past 30 days. A survey of 125 students on campus who are between the ages of 18 and 25 showed that 83 have used alcohol in the past 30 days. Test the claim at the 0.05 level of significance.

3) A group of 630 adults were asked whether they take vitamins. Three hundred eighty-four of the people asked said yes. Test the claim that less than 75% of adults take vitamins, using the 0.01 level of significance.