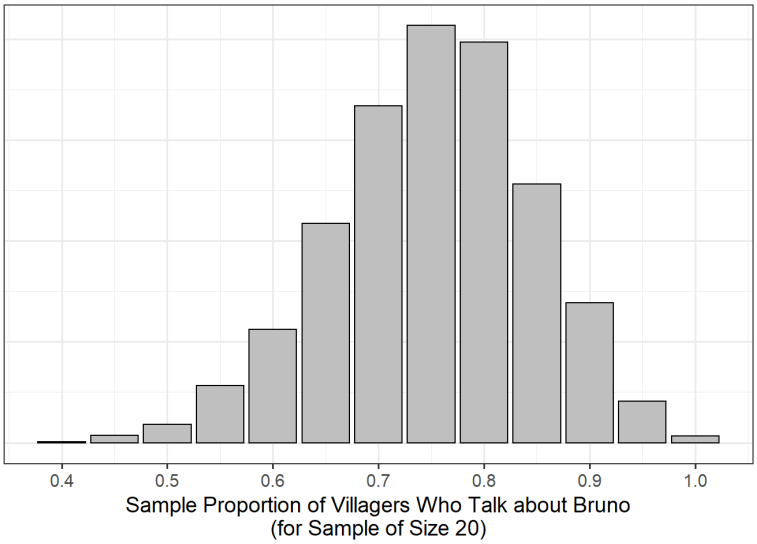
Workshop Webpage: https://aloy.github.io/uscots2023/

Prompt:

Mirabel needs to find her Tío Bruno. Despite claiming that they don't talk about Bruno, Mirabel has found that when given the opportunity, several people will share their feelings about her reclusive uncle.

Mirabel is interested in the proportion of villagers who will share their thoughts on Bruno. She discreetly asks a random sample of n = 20 villagers about Bruno, and she records whether the individual shares their thoughts on Bruno or simply refuses to speak about Bruno. She is interested in testing the following hypotheses



H_0: $\theta \leq 0.75$ vs. H_1: $\theta > 0.75$

where θ is the proportion of villagers who will share their thoughts on Bruno.

To the right is the null distribution for this scenario. Based on the graphic, how many villagers in Mirabel's sample would need to share their thoughts on Bruno in order for Mirabel to have evidence to support the alternative hypothesis? Explain.

On a 0-10 point scale, what grade would you assign to each of the following solutions?

Solution 1:
Mirabel would need at least 16 to share their thoughts because 16/20 > 0.75.

Solution 2:
Mirabel would need at least 19 to share their thoughts because that would result in a small p-value.

Solution 3:
Mirabel would need at least 19 to share their thoughts. The null distribution specifies the statistics we would expect to see across repeated samples if the null hypothesis were true. Therefore, in order to provide evidence for the alternative hypothesis, we would need the statistic to fall into the upper tail region of the null distribution. The further in the tail, the stronger the evidence against the null hypothesis. The area under the curve to the right of the statistic is the p-value; with a statistic of at least 0.95 (19/20 individuals), the p-value would be very small, providing evidence in favor of Mirabel's statement.