STAT 230: Quiz #2
Spring 2020
Points: 20

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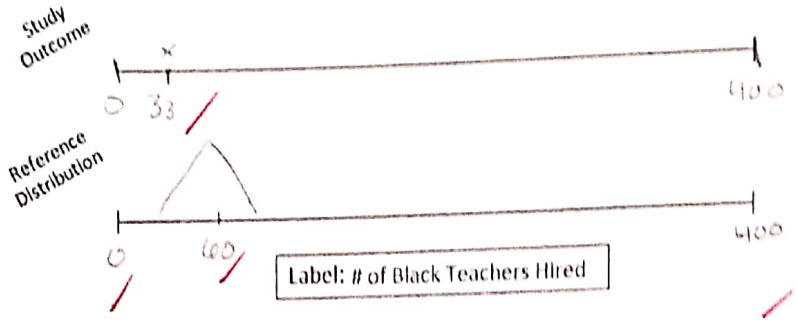
20

In 1977, the U.S. government sued the City of Hazelwood (a suburb of St. Louis) on the grounds that the district had discriminated against black persons in its hiring of school teachers. The statistical evidence introduced noted that of the 400 teachers hired in 1972 and 1973 (the years following the passage of the Civil Rights Act), only 33 were black. According to 1970 census figures, about 15% of teachers employed in the surrounding areas in St. Louis County that year were black.

Research Question: Is there statistical evidence to suggest that the City of Hazelwood discriminated against blacks in the hiring of school teachers during this time period?

1. Identify the smallest possible value, largest possible value, location of the reference distribution, and the outcome from the study for this situation on the number line below. (5 pts)

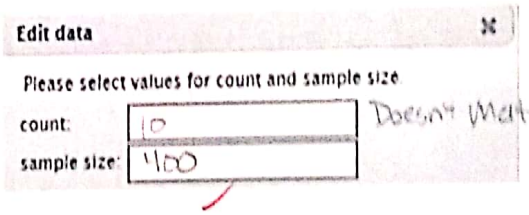
- Smallest possible value
- Largest possible value
- Location of pyramid
- Outcome from study



2. Next, provide details for the setup of a simulation in StatKey that would allow us to investigate the research question stated above. (3 pts)

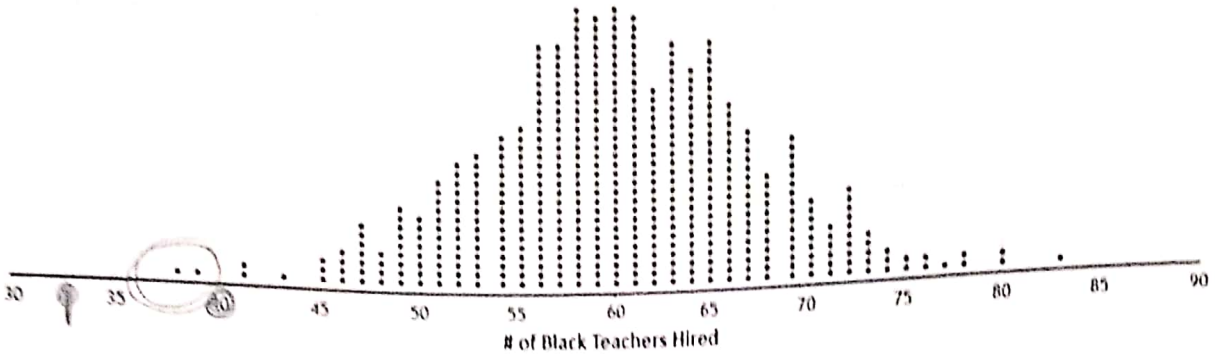
Identify the following

- Sample size
- Null Hypothesis value



Null hypothesis: p = .15

Consider the following reference distribution obtained from my simulation. This simulation contains 500 repeated iterations.



3. The outcome from this study is 33 which is clearly an outlier on the lower-end of this distribution. The p-value for this test is 0.00003 (which is less than 0.05). This implies we have enough statistical evidence for the research question. Write an appropriate conclusion for this test using laymen's language. (4 pts)

The data provides enough evidence to support the claim that the hiring of teachers in the City of Hazelwood in 1972 and 1973 was discriminatory against blacks. (p=.00003) ✓

4. This is a one-tailed left test. Explain why it is a one-tailed left test. (2 pts)

"Discrimination Against" in the context of hiring, means that "fewer" blacks were hired than the distribution pyramid (center (in this case 15% of 400 = 60). "Fewer" in this case is the left tail of the distribution

5. Suppose that instead of the study outcome being 33 it was 40. Use the reference distribution provided above to estimate the p-value for this test when the study outcome is 40. (3 pts)
Note: The reference distribution contains 500 repeated outcomes.

P-value: .004 ✓ 2/500 = .004

6. Discuss the scope-of-inference for this problem. That is, for whom does the conclusion written above apply? (2 pts)

good ✓

"Surrounding areas in St. Louis County"
I would go on to restrict this scope of inference to 1972 and 1973
↳ I would expect this distribution to be different for other areas, and for different timeframes.