**­STAT 477/STAT 577**

**HW 3**

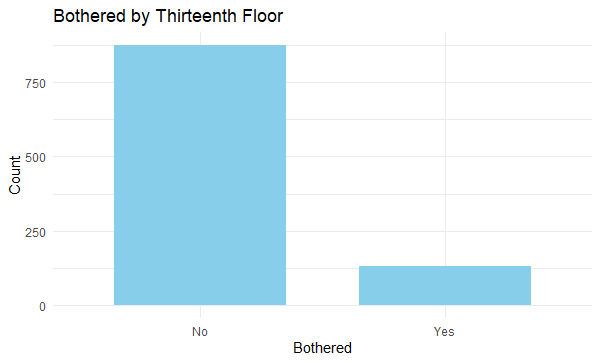
**Neha Maddali**

1. The number 13

a. Summary Table



Bar Graph



b. Confidence Interval = [0.1094222, 0.1510152]

c. Interpretation of Confidence Interval: The 95% confidence interval for the population proportion bothered by staying on the 13th floor, based on the normal approximation method, is [0.109, 0.151]. This means that we are 95% confident that the true proportion of individuals bothered by the 13th floor lies within this interval, suggesting a relatively narrow range for the estimated population proportion.Top of Form

d. Confidence Interval = [0.1108208, 0.1524299]

Compare to interval from part b: The 95% confidence interval for the population proportion bothered by staying on the 13th floor calculated using Wilson’s score method is [0.1108, 0.1524]. When compared to the interval obtained in part b, the intervals are very close, indicating that both methods yield similar estimates for the population proportion with a 95% level of confidence.

e. sample size = 1691 (refer to R code, using normal approximation method)

2. Global warming

a. population proportion of interest = p refers to the proportion of all adults aged 18 or older in the US who believe that global warming is more a result of human actions than natural causes. P represents the true, underlying proportion of individuals who hold this belief in the entire adult population.

b. sample proportion = p̂ = 662/1019 = 0.64966

c. Confidence Interval = [0.6198521, 0.6783369]

d. Interpretation of Confidence Interval: We are 95% confident that the true proportion of individuals who hold this belief that global warming is more a result of human actions than natural causes lie within this interval, providing a range for the estimated population proportion.

e. sample size = 1537 (refer to R code, using normal approximation method)

3. Coverage Rate

a. Any different from 95%? If so, which one(s)?

When p = 0.05 and n=25, the coverage rate is notably lower at 72.133%

When p = 0.5 and n=25, the coverage rate is higher at 95.695%

b. Any different from 95%? If so, which one(s)?

When p = 0.05 and n=25, the coverage rate is notably higher at 96.664%

When p = 0.25 and n=25, the coverage rate is lower at 93.853%

When p = 0.5 and n=25, the coverage rate is higher at 95.661%

c. Any new information by adding p = 0.75 and p = 0.95 to simulation? Explain.

Yes, including values of p=0.75 and p=0.95 would provide valuable information. Including these values can represent scenarios where success is more likely, and we could gain insights on how well the confidence interval methods perform across a broader spectrum of probabilities. Including higher values of p in the simulation allow us to assess the methods’ performance under different conditions especially when the probability of success is closer to 1.

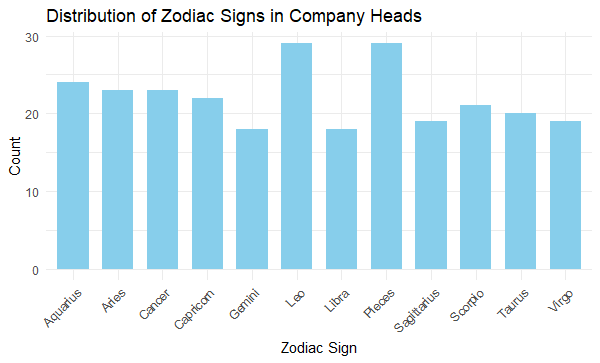
4. Zodiac

a. Summary Table

A screen shot of a black background

Description automatically generated

Bar Graph



b. Null Hypothesis H0: the distribution of zodiac signs is equal (p1 = p2 = … p12)

Alternative Hypothesis Ha: the distribution of zodiac signs is not equal (p1 ≠ p2 ≠ … p12)

c. Expected Value = 22.08333

d. Contribution from Scorpio = 0.05314465

e. Test Statistic = 7.196226

f. Degrees of Freedom = 11

g. p-value = 0.7829773

h. Conclusion = There is not enough evidence to suggest a significant association between zodiac signs and the likelihood of being a head of the largest 400 companies.