Pre-analysis steps

Data was collected using a Google Form consisting of seven questions exploring opinions on the topic, “Is a hot dog a sandwich?” The responses were downloaded as a CSV file and subsequently cleaned to ensure uniformity and consistency across the dataset. This is particularly important for the “Yes/No” column, where some of the responses were not consistent, such as the use of lowercase or uppercase letters and irregular responses such as “Yess” or “N”. The data was then explored by making plots to see the demographics of our participants and start investigating our research question.

Analysis methods

Our hypothesis is ½ of UVA full-time undergraduate students believe a hot dog is a sandwich. We will use a one-sample z-test for proportions to test our hypothesis. Our sample proportion will be found by dividing the number of students in our sample who believe a hot dog is a sandwich by the total number of students surveyed. Our population proportion will be assumed to be 0.5, as that’s the hypothesis proposes. We will then calculate a z-score value using the formula:

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

where:

- $\hat{p}$ = sample proportion
- p_0 = hypothesized population proportion (0.5)
- n = sample size

We can then use the z-score to calculate a p-value, and if the p-value is less than a significance level of 0.05 (given we are using a two tailed test), then we can reject the null hypothesis. Looking up values from a table, our decision rule is simply if Z is less than -1.96 or greater than 1.96, we will reject the null hypothesis.

Evaluation of success

Our analysis will be successful if we correctly evaluate the hypothesis using the proportion test and can determine if we accept or reject the hypothesis that over ½ of full-time UVA undergraduate students believe that a hot dog is a sandwich using statistical measures.

After cleaning the data, we found that out of 54 valid responses (people enrolled in UVA as an undergraduate student), 33 people said no and 21 people said yes. This means our sample proportion is 21/54, or 0.388888889. If we follow the formula, we get a z-score of z =

(0.388888889 - 0.5) / sqrt((0.5*0.5)/54) = -1.63299316032. Therefore, because our z-score is not less than -1.96 or greater than 1.96, we fail to reject the null hypothesis that half of UVA full-time undergraduate students believe a hot dog is a sandwich (at a significance level of 0.05).