Hypothesis Testing Assessment

The objective of this assignment is to use methods we have studied in hypothesis testing to test claims about the Moringa population. You may choose to investigate a printed claim about a population and design and conduct a survey to challenge (or fail to challenge) the claim in its application to Moringa students. You may instead choose to compare opinions or attributes between two subpopulations. You may work with up one other person but please note that every student must submit their own work.

Your (typed) assessment should be conducted as follows:

- Find an article in a newspaper, magazine or on the internet that makes or references a claim about ONE population mean or ONE population proportion. Use this claim as the null or alternative hypothesis in a test of significance of the Moringa population.
    - Include a summary page from the article in your assessment.

- Propose a comparison between two subpopulations of Moringa using sample means or sample proportions based on the test you described above. For example, if the claim you chose was about the average amount of soda people drink in a week, then you might compare the average amounts consumed by students over 22 and students under 22.

- Detail your sampling procedure. Be thorough and specific.

- Conduct your survey. You must have more than 100 (total) responses in your sample. When you submit your final assessment, include copies of the question(s) asked and images of the tally sheet(s) or the set of questionnaires that you used to collect data. (This is evidence your data is real.)

- State the statistics that are a result of your data collection: sample size(s), sample mean(s) or proportion(s), and sample standard deviation(s).

- Create graphs that illustrate your data. These may be pie or bar charts or maybe histograms or box plots, depending on the nature of your data. Produce graphs that make sense for your data and give useful visual information about your data. You may need to look at several types of graphs before you decide which is the most appropriate for the type of data in your assessment. Do not hand-draw this without consulting me.

- Record two hypothesis tests (as we have done in class – use the Significance Testing notes), based on your study. One for the single claim tested against the Moringa population and the other a two-sample test comparing two subpopulations at Moringa. Make sure all members of your group check your draft solutions to see if they are done

correctly. Make your decisions using a 5% level of significance. Include your test in the appendix of your paper.

- Identify the type of errors you are potentially committing based on your hypothesis decisions. Provide at least one consequence of each of these errors.

- Construct a 95% confidence interval with your results for each test and interpret their meanings. Include a graph showing the bounds and sample mean/proportion or their differences.

- Summarize the results of your assessment (in complete sentences and paragraphs, with proper grammar and correct spelling). The summary MUST include:

    - An introduction that presents your study and tries to hook the reader (not just a description of the question and the results.).

    - A brief summary of the article, including the source and claim and a discussion of the comparison you are conducting and your reason for choosing it.
    - A detailed description of how, where, and when you collected the data, including the sampling technique.

    - The conclusion about the article claim and the comparison in light of your hypothesis tests. This is the conclusion of your respective hypothesis tests, stated in words, in the context of the situation in your assessment in sentence form, as if you were writing this conclusion for a non-statistician.

    - A concluding paragraph that references your hypothesis test results, your confidence interval (and its interpretation in the context of the situation in your assessment), the error you may be in danger of committing as a result of your hypothesis decision, any shortcomings you may feel your hypothesis test may have suffered and things you would do to improve your study in the future.

    - An appendix including the original article or a summary of it; your survey results; your hypothesis test calculations; graphs of your hypothesis tests; and graphs of your confidence intervals.