

Overview

Hypothesis testing refers to the process of using statistical analysis to determine if the observed differences between two or more sample means are due to random chance (as stated in the null hypothesis) or are true differences in the samples (as stated in the alternate hypothesis). A null hypothesis is a stated assumption that there is no difference in mean for two or more populations. The alternate hypothesis is a statement that the observed difference or relationship between two populations is real and not the result of chance or an error in sampling.

Hypothesis testing is the process of using a variety of statistical tools to analyze data and, ultimately, to fail to reject or reject the null hypothesis. From a practical point of view, finding statistical evidence that the null hypothesis is false allows you to reject the null hypothesis and accept the alternate hypothesis

Purpose

The most important aspects of any statistical analysis are stating questions and collecting data. Hence, to get the full experience of running your own study, the project requires you to analyze data that you collect. It is not permissible to use data sets that have been put together by others.

You are permitted to collect data off of the web;

however, you must be the one who decides on the analyses and puts the data set together.

Good projects begin with very clear and well-defined hypotheses. You should think of questions that interest you first, then worry about how to collect and analyze data to address those questions. Generally, vague topics lead to uninteresting projects. For example, surveying Webster students to see which sex studies more doesn't yield a whole lot of interesting conclusions. On the other hand, it would be interesting to hypothesize why men or women study more, and then figure out how to collect and analyze data to test your hypotheses.

Report Format

I. Introduction

What are your hypotheses? How did you come up with them? Why do you think they are important? Why do you think the data will support these hypotheses? What are some of the implications if your hypotheses are true? Have you seen similar reports or projects? This section should be about 1 page and should be started as soon as your hypotheses are cleared with me. Remember, you are collecting numbers in order to calculate a mean.

You are not conducting a survey for this report.

II. Data Collection.

A. Proposed. How do you plan on collecting your data? How will you try to achieve randomness? Will you use simple random sampling, stratified sampling, or some other method? Will you use surveys, polling, published material or something else? What problems do you foresee? Will you eliminate as much bias as you can? How do you hope to deal with your problems?

B. Actual.

What did you actually do? How well did it go? What problems did/didn't arise? Were you able to deal with them? Did you have to change the format of your hypothesis and/or did you have to come up with a completely new one?

Part II should be 1-2 pages. Remember the data must be collected early in order to have enough time for the analysis.

III. Analysis of Data.

This is where you actually do the analysis of data and the statistics of the hypothesis test. Be sure to check with me early, if you are not sure which type of test you should be doing. Which graphical representations (pie chart, bar chart, histogram, etc.) best describe your data? Which tests did you use? Why were these the appropriate tests? Were all the guidelines and

assumptions for using the test met? What were the results? Did you need to collect additional data?

This part should be 2-3 pages, depending on the number of graphs that were reasonable.

IV. Conclusion.

Did your tests agree with your original hypothesis? (Your grade does not have any relation to the answer to this question.) If not, why do you think it didn't? Would further tests perhaps bear out your original claim? If you were to do the project over, are there things you would do differently? What implications are there to your results? Is there some organization, business, or campus department that should receive a copy of this? What, if anything, have you learned from this project?

This part should be about 1 page.

V. Appendix.

If you have any raw data (such as tally sheets, or questionnaires) it should be included here.

Grading on this paper will depend on a number of things. Like any paper, you will be graded on the originality and proper use of the English language

(including grammar and spelling), and the neatness and professionalism of your report. Note that nearly every paper I see loses a number of points because of poor English. I would advise you to have someone proofread the project before it is turned in. In addition, you will be graded on how well you follow the above format.

Finally, your statistics are expected to be sound. If you make a statistical mistake, it will hurt your grade.

You will also be graded on the way that you make your paper readable to the average person. One of the important skills of a researcher is the ability to converse with an outside world in language that it understands. Obviously, there are technical aspects to this paper and you can't make everything clear to a lay person, but do your best.