Instructions and Guidelines for Final Lab Report

Introduction

Your lab-write up will be based on one of two experiments that you will perform. The goal of your final lab report is to formulate, test, analyze and discuss a testable hypothesis based on the lab data collected from these experiments. The experiments will be provided in separate documents. You will select one of the following experiments:

1) Cardiovascular Responses in Changes in Posture
2) Cardiovascular Responses in Changes in Exercise

With any research question, you will need to state how you will test it. You can formulate your hypothesis in a way that incorporates all the available measurements that you will take, or just some of it. It is completely up to you. You can state a broad hypothesis and then go into detail about how you will test it, or you can state a very specific hypothesis and then detail how you will test it. You can also have a multi-part hypothesis if you wanted to incorporate a lot of the measurements directly and feel that is easier to break the testable questions up.

Here are a few examples of the different avenues you can explore. Given your data, a hypothesis might be along the liens of a narrow hypothesis looking explicitly and directly at one component of the data, like "my hypothesis is that blood pressure increases with age during exercise" or you could choose to group your data, like "my hypothesis is that higher fitness level correlates with less changes in blood pressure with postural changes".

These are just examples. There are many different hypotheses that you could generate from these data. Be creative! To be clear, you only need to pick ONE experiment to run. You should NOT do both.

Content

All papers must be typed (12 point, Times New Roman), double-spaced, and with 1-inch margins on each side. Make sure you label each section in your paper with the labels in bold.

Title Page (5 points) should be on a separate page and include:

1) An informative title
2) Your name
3) Course number and title
4) Date

Introduction (1-1.5 pages; 25 points) should include the following topics:

1) Background on the cardiovascular system, blood pressure, heart rate, etc. Make sure you discuss these topics so someone who has no background could understand what you are studying.
2) What is the objective of your experiment?
3) What is your hypothesis? Come up with a testable question that you can answer using the data given, then state your hypothesis. You can have more than one hypothesis.

Materials and Methods (30 points) should be divided into the following subheadings:

1) **Participants** – where did the data come from and who participated? Be specific: number of subjects, age, occupation, etc.
2) **Data Collection** – Measurements of blood pressure, heart rate, and index of physical fitness; how were these things measured? What materials were required? What were different time points used? This

should be written in a way that someone could re-create the experiment that you did on their own by following your directions.

3) **Analysis** – How did you analyze your results? For example, did you make graphs to look at trends? What type of graphs did you use and why? Also, when making these graphs, did you use averages or raw data?

You will want to reference the experiments for some details that are provided.

Results (40 points) should include the following:

1. Table 1: Index of Physical Fitness for each subject that you used
2. Table 2: a table based of the data that tests part of your hypothesis
3. Figure 1: a graph based off of table one that shows the results of your test
4. Table 3: a table based off the data that tests a different part of your hypothesis
5. Figure 2: a graph based off of table 2 that shows the results of your test (must be a different type of graph than in figure 1).

Be sure that all graphs are properly created and labeled (see How to Make a Graph in Excel for detailed examples of how to manipulate data sets and generate scientific graphs). Each table and figure should have text describing each in detail.

Discussion (1.5-2 pages; 45 points) and include the following topics:

1) Restate your hypothesis. Was your hypothesis supported?
2) Briefly summarize your results. Then speculate. Why do you think these results occurred?
3) Describe any outliers or individuals that fell outside the typical range of results and provide a plausible explanation for these results.
4) Summarize your findings in context to your subject (i.e. does exercise affect blood pressure? Why or why not? Does fitness level affect blood pressure? Why or why not?).
5) Discuss limitations of this research (i.e. was your blood pressure cuff the best and most accurate to use? Did your methodology leave little room for error during exercise?).
6) Discuss implications for the public (i.e. should exercise be considered beneficial for someone with high blood pressure?).

References (5 points) should be on a separate page:

1) A minimum of FOUR references must be included in your paper. You can use your textbook as one of the references, but the other three must be outside sources.
2) References should be cited TWICE: immediately after the statement within the paper, and at the end in the reference section.
3) Please use APA citation style for in text [(Marieb & Keller, 2016)] and in the reference section (example: Marieb, E. N., & Keller, S. M. (2016). *Essentials of Human Anatomy & Physiology* (12th ed.). Boston: Pearson)

Total: 150 points