

Heart Rate Comparison Assignment

In lab this week, you explored how to effectively consolidate samples (averages) and compare those mathematically to see if there is a significant difference (a t-test with an interpretation of p-values). For this assignment, you will demonstrate that you can repeat the task so we know you have mastered the skill for future experiments you will design in this course.

Using the heart rate data collected from your class, you will **compare your group's average heart rate to the average of the heart rates of your entire lab**.

Complete the following tasks and **submit them before your next lab meeting** (a rubric with point allocations can be found on the last page of this assignment).

1. Write a null hypothesis, a one-tailed hypothesis, and a two-tailed hypothesis predicting how your group's average will compare to the average of the class.
2. Create a figure (graph and caption) that compares the two averages using a column graph with standard error bars (see Appendix A in the lab manual for guidance on formatting).
3. Write a 1-2 sentence conclusion stating which of your hypotheses was supported and provide the statistical support (interpret your p-value).
4. Lastly, relate your results to your life; briefly, discuss how your individual heart rate average compares to your group's, your whole lab's, and the averages of the general population (Table 1 on the next page).
5. As an appendix, paste your Excel sheet showing your heart rate data comparisons for your group's data and the class data; you should include your averages, standard error bar calculations, and p-value.

Normal Heart Rate by Age

Age Group	Heart Rate
Preterm	120 – 180
Newborn (0 to 1 month)	100 – 160
Infant (1 to 12 months)	80 – 140
Toddler (1 to 3 years)	80 – 130
Preschool (3 to 5 years)	80 – 110
School Age (6 to 12 years)	70 – 100
Adolescents (13 to 18 years) and Adults	60 – 100

Table 1. Reference Heart Rate for different age brackets. Retrieved from:
https://www.ncbi.nlm.nih.gov/books/NBK593193/table/ch1survey.T.normal_heart_rate_by_age/

Want to know more about heart rate?

<https://my.clevelandclinic.org/health/diagnostics/heart-rate>

Rubric For Grading

Hypothesis	Absent	Incorrect formatting/ missing information	Correct formatting and information
Null	0	0.5	1
One-tailed	0	0.5	1
Two-tailed	0	0.5	1
Figure (See Appendix A in the lab manual for guidance on formatting)			
Bar graph	0	0.5	1
Standard error bars	0	0.5	1
Axis labeled	0	0.5	1
Caption	subdivided below		
Descriptive Sentence	0	0.5	1
Quantitative comparison including p-value	0	0.5	1
Conclusion			
Significance statement	0	0.5	1
In-text reference	0	0.5	1
Relevance and connection	0	0.5	1
Appendix with Data calculations	0	0.5	1
		Total	