> This is an **team** graded event. While receiving help from outside your team is permitted with proper documentation, over-reliance on the assistance from others may result in grade reduction.

> Answer the questions on a separate document. Submit all code using the "Compile Report Document" button found at the top of your script in RStudio, ensure you select "MS Word". Ensure each section of code has a committed label with its corresponding problem, example "#Problem1". If you run out of room for an answer, you may attach additional sheets of paper.

Read "Rhesus monkeys correctly read the goal-relevant gestures of a human agent" by Hauser, Glynn and Wood (*Proceedings: Biological Sciences.*, 2007, 274:1913-1918) and then answer the following questions.

STEP 1: Ask a research question.

1. State the research questions the researchers investigate in this study.

STEP 2: Design a study and collect data.

2. What are the observational units and sample size of the individual experiments in this study?

3. What variables did the researchers collect? State whether each variable is quantitative or categorical.

4. Summarize the procedure used in the experiment. Your explanation should summarize the description in the article in a clear and concise manner.

5. Why did the researchers conduct trials with an apple slice and without an apple slice?

6. Why did the researchers use multiple gesture types?

Questions 7-17 refer to the food-present communicating gesture condition experiment.

7. Describe the parameter of interest in words. Assign the proper mathematical symbol to the parameter of interest.

8. In words, state the null and alternative hypothesis tested.

9. Using symbols, state the null and alternative hypothesis tested.

STEP 3: Explore the data.

10. When you look at **Figure 2** do you believe that rhesus monkeys are being influenced by the experimenter's actions?

11. Calculate the relevant statistic for this portion (food-present communicating gesture condition) of the experiment. Use the appropriate symbol.

12. Is it possible to observe the above sample statistic even if all of the rhesus monkeys are randomly selecting a box? Explain.

STEP 4: Draw Inferences.

13. Use the **3S Strategy** to investigate how much evidence the sample data provide to support your conjecture (hypothesis).

    (a) Statistic:

    (b) Simulate: Use the **One Proportion** applet to simulate 1000 repetitions of this study. Provide a screen shot of your completed simulation.

        i. What are you assuming when you simulate your null distribution?

        ii. What is the center of your null distribution and does it make sense that this is the center? Explain.

    (c) Strength of evidence

        i. When looking at the null distribution you have simulated, is your observed statistic a very unlikely result if your null hypothesis is true?

        ii. Determine the p-value from your simulation analysis. Interpret what the p-value represents.

14. Use the theory-based test to determine the p-value for the food-present communicating gesture condition experiment. Provide the R code and output for the theory-based test.

    (a) Are the validity conditions met for this test? Explain.

    (b) What is the p-value?

    (c) How does your p-value compare to the p-value presented in the paper?

STEP 5: Formulate Conclusions.

15. Based on your p-values, how much evidence does the data provide against your null hypothesis? Why?

16. Summarize conclusions you can draw from your analysis. Also explain the reasoning process behind your conclusion.

17. How broadly are you willing to generalize your conclusions? Would you be willing to generalize your conclusions to all rhesus monkeys, primates, or mammals?

STEP 6: Look back and ahead.

18. How do the researcher's findings support or contradict previous research? You only need to discuss one comparison discussed in the article.