

Red Light Reaction

Goals: This project will help to determine the rule of safe following distance while driving. Students will use the [Red Light Reaction](#) applets to collect data randomly, then analyze them and answer the following questions:

1. Students will estimate how fast drivers apply the car break after seeing the red lights flash from the car in front. (Applet 1)
2. Students will also estimate how fast drivers apply the car break with visual distractions. (Applet 2)
3. Using t-test for matched pairs to determine drivers react slower with visual distractions.
4. Use collect data to suggest a safe following distance while driving.

PROJECT:

Choose one of the topics below or your group can propose a topic.

1. Teens have troubles when “driving” with distractions.
2. People who are younger than 24 years old have troubles when “driving” with distractions.
3. Men have troubles when “driving” with distractions.
4. People who work with computers have troubles when “driving” with distractions.
5. People who play computer games have troubles when “driving” with distractions.
6. People who have been driving for more than 3 years have troubles when “driving” with distractions.
7. Married people have troubles when “driving” with distractions.
8. Women have troubles when “driving” with distractions.

Each student has to give a survey of a group of at least 10 people. Students then will combine data with their group of **five** students and apply the material in this course to analyze the group data. When students have a group topic, please sign up on Canvas. Make sure your topic is not the same with any topic posted on Canvas. To get 5pts, each group needs to sign up before the deadline on Canvas.

Your project will be graded in the following categories: Sign-up, Collecting Data, Presentation, Participation, Group report, and Individual report. See the rubric on the next page.

Collecting data: Go to geogebra.org to create an account. Then use the [Red Light Reaction](#) applets to create a classroom. (Click [here to see how to](#) do that.) Add your first name and initial of your last name in front of your classroom app. **Make sure you add tphanya3@calstatela.edu as a co-teacher before sharing the link.** Get the link and give it to people you want to survey. Enter data on a spreadsheet/Excel file and submit it to your group folder. Each student will get all possible points if posting survey data by the deadline on Canvas.

Presentation: Each group creates a video (3-5 minutes). The video should summarize your group work (not individual). Make sure all group members present in the video.

Participation: Each student will get 10 pts for writing the group report and creating the group video. All points (10x5=50 points) will be put together as a group. Each group member will be graded based on how much work s/he contributes to the group.

Individual and group reports must be **posted by the deadline on Canvas** to get full credit. **Scroll down to see the requirements for the individual and group report.**

Your individual report must include the cover page and follow the format on the next page.

Final Project Requirements

Cover Page

- Title
- Your names and Group #
- The rubric as seen below.

Project Name:

Sign up: _____/5

Collecting data: _____/10

Participation: _____/10

Presentation: _____/10

Group report: _____/35

Individual report: _____/30

Individual Report (Essay form)

Cover Page: (2pts) You are free to add pictures/quotes on the page above but must **include all information as seen on the page above.**

Introduction: (6 pts)

Provide an in-depth description of your project, including your name, your group topic, clearly expressing what the data and variables represent and how you collect data. (Add your GGB link here.)

Body (15pts)

Then analyze your own data (10 or more) to report the followings:

1. Estimate the 95% confidence interval for the mean of time for Applet 1 and Applet 2.
2. Explain any different results between **Applet 1** to **Applet 2**. If you do not show the statistical process, you will not receive any credit for this section.
3. Explain any different results between **your data** to **your group data**. If you do not show the statistical process, you will not receive any credit for this section.

Conclusion (7 pts)

1. **State your research question again and explain your conclusion based on your research.**
2. **Illustrate any possible confounding variables or bias that could hinder your conclusion.**

GROUP REPORT

Use Zoom to make a short video (3-5 minutes) to report all items below. Make sure you indicate *who does what*.

The group report must answer the followings:

Introduction: (5 pts) Names of all group members. Describe the location and population where you collect data.

Body: Include your group raw data and your work for the following items:

Part 1: (10 pts)

From your group data, estimate the 95% confidence interval for the mean of time for Applet 1 and Applet 2.

Use group data to suggest a safe following distance (in seconds) while driving. Remember to show all your work. Otherwise, you will not receive any credit for this section.

Part 2: (12 pts)

a. Introduce your claim about the performance of your group data. For example, “*Cal State LA students have troubles when driving with distractions.*” Show the boxplot of the time difference between Applet 1 and Applet 2 with outliers (if any) and the boxplot without outliers.

b. Find the time difference between Applet 1 and Applet 2. Use the t-test for a mean to test your claim (i.e. people in your survey take the same time to react in both applets – the time difference is 0.) Make sure to state what significance level you used. Remember to show all your work. If you do not show the statistical process, you will not receive any credit for this section. From your result, make a conclusion for your claim.

Conclusion: (8 pts) Based your work on Part 1 and Part 2, write your conclusion using public language.