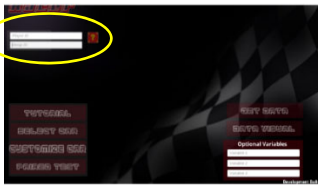
Comparing Two Race Cars
Racer Lab: Part A

Step 1: Introduction

In this lab, you will be playing an online racing game. **You will start by playing a Tutorial and then evaluating whether there is evidence to support the hypothesis that the cars have different speeds.** Each car you select can be raced multiple times on a track and the time to complete each race will be recorded. After you race the cars, the data will be available for you to analyze.



To play *Racer,* go to the following URL:
https://www.stat2games.sites.grinnell.edu/games/racer20.html
(Note: *This site may take a few minutes to load.*)

1. Input a **Player ID**: _____
   This will be on the internet, so you probably *do not want to use a name that will identify you.*

2. Record your **Group ID**: _____
   Your instructor will give you a **Group ID,** which will be identical for every person in the class.

3. To start, click on the **Tutorial** button and complete the tutorial. Record your Finish Times after each race

	Car Type	Finish Time
1st Car	Nightingale	
2nd Car	Bayes	

4. ***After all students have completed the Racer Tutorial Game***, go to http://shiny.grinnell.edu/RacerTTests/ and use the following settings to find the sample size, mean, and standard deviation for your class data. Make sure you wait until all students in your class have finished the tutorial.

   - Enter the **Group ID** for your class.
   - Make sure that both **Level** and **Track** say **Tutorial**
   - X Axis: **Body**
   - Y Axis: **Finish Time**
   - Check **Add Boxplot**
   - Check **Show Summary Statistics**

	N	Mean	SD
Bayes			
Nightingale			

5. Do you believe the data shows evidence of a difference between the speeds of the Bayes and Nightingale cars? **Yes** ____ **No**_____

6. How confident are you that one car is faster than the other? Give a numerical representation of your confidence (0% confident to 100% confident). _____

7. Explain your reasoning for Questions 5 and 6.

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Step 2: Evaluating the Data

Now that you have gathered some data, watch the following video as it discusses various modifications made to data from a previous class: https://www.youtube.com/watch?v=isWnFFORQVE&t=294s.

Go back to http://shiny.grinnell.edu/RacerTTests/ and work in small groups to answer the following questions.

8. How many people played the game in your class? _____

9. Who was the fastest Player? What criteria did you use to determine who is fastest?

10. List any **PlayerIDs** from your class that you believe should be removed from the dataset. If you chose to remove any players, give a ***brief*** explanation as to why they were removed.

11. Change the X-axis to **Body**. Submit the sample size, mean, and standard deviation for your class data (with the players you identified removed). ***Explain why N should be identical for both the Bayes and Nightingale cars***.

	N	Mean	SD
Bayes			
Nightingale			

12. Change the X-axis to **Order** (this is the order in which the races were completed). Submit the sample size, mean, and standard deviation for your class data (with the players you identified removed). ***Explain why the numbers in the means in Questions 11 and 12 are identical***.

	N	Mean	SD
1			
2			

13. With this class tutorial data, could the difference in car speeds be due to order? For example, could people who played the game two times tend to get better Finish Times the second time they race a car?

14. How confident are you that one car is faster than the other? Give a numerical representation of your confidence (0% confident to 100% confident). _____**.** ***Explain your reasoning.***