

Project 1

Math 121

Please type your solutions to the questions below in Microsoft Word or Google Docs (or other document editor) and turn in your solutions in class on **Thursday, November 10th**. Use complete sentences to write your answers. It is okay to discuss the problems with other students, but all of your solutions must be explained in your own words.

Below is a contingency table about occupants of vehicles that were involved in fatal car accidents in 2016. The information includes whether the occupant was restrained (wore a seat belt) or not and whether the occupant survived or not. Source: NHTSA CrashStats.

	Restraint Used	Not Restrained
Occupant survived	31,533	5,154
Occupant died	11,282	10,428

1. Use a spreadsheet (e.g., Google Sheets or Microsoft Excel) to make a stacked bar graph that shows the column proportions in the table above (in particular, we want to compare the survival rates in the two columns). Cut and paste your graph into your document. Make sure that your graph is clearly labeled.
2. What is the relative risk here? That is, how many times more likely are people to survive if they are wearing a seat belt than if they are not?
3. From the data, it looks like people wearing seat belts are more likely to survive a fatal accident, but is this data statistically significant? Carry out an appropriate hypothesis test and explain what the results mean. Be sure to include a statement of the hypotheses, the test statistic (z -value), and the p -value as part of your answer.
4. Find a 95% confidence interval for the difference in survival rates for restrained versus unrestrained vehicle occupants. Explain in words you are 95% confident is in the interval.
5. Are there any confounding variables that might be associated with both survival and seat belt usage? Choose two examples, and describe the effect they might have.