**Project 2: Residential Proximity to Major Highways in the United States**

**Instructions: Work in small groups (between 1-3 people) to complete this project. If you work with others, you should all actively contribute to each problem, and your work should be divided evenly. You will be asked to write and sign the honor pledge on your project, to indicate that you each contributed appropriately.**

**Section 1: Read the attached article and answer the following questions. You may write your answers on this sheet, or you may type up your answers on a separate document. Each of the short answer questions should be answered in 1-3 sentences.**

1. **Introduction**: Explain, citing evidence from the article, how proximity to major traffic roads is related to public health.
2. **Introduction**: This study looked at all people who lived within 150 meters of a major roadway. Why did the study choose this number (150) as the cutoff?
3. **Introduction**: What do the authors hypothesize the relationship between socioeconomic status and air pollution exposure is?
4. **Results**: Which variables that were looked at saw large disparities of percentages living within 150 meters of a major highway? Which variables saw small/no disparities?
5. **Discussion**: What is the correlation between living in urban areas and people exposure to a major highway? Explain what this correlation value (R=0.65) means.

**Section 2: Answer the following questions based on the data provided in the article. If you are sked to perform a computation, include the computation and its result in the space provided.**

1. 11,337,933 people make up 3.7% of the total US population. Using that information, what is the total population of the US?
2. Consider the two populations labeled Non-Hispanic White and Non-Hispanic Black. Of these two, which population had **more people** living within 150 meters of a major highway? Which population had **a larger percentage of people** living within 150 meters of a major highway? Which of those statistics do you think is more meaningful in this conversation?
3. Approximately how many people in the US speak primarily Spanish in their households?
4. How do the authors define the "Poor" characteristic? What how many people in the US, in total, are classified as "Poor" under this definition?
5. Using the information from the table found in the article; fill in the blanks to complete the following contingency table, which compares people’s proximity to major highways to the language predominantly spoken in their home:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Within 150 meters of a major highway | Not within 150 meters of a major highway | **Total** |
| English only | 7,513,304 (3.3%) | 220162575 (96.7%) | **227,675,879 (100%)** |
| Spanish | 1,805,261 (5.1%) |  |  |
| Other | 1,059,572 (4.9%) |  |  |
| **Total** | **10,378,137** |  |  |

1. Notice that the number you found for "total" in the first column (10,378,137)differs a bit from the "Total" number found in the table in the article (11,337,933). Why do you think this is?
2. What proportion of the US population primarily speaks Spanish in their home?
3. What proportion of predominantly Spanish-speakers live close to a major highway?
4. Of the people who live close to a major highway, what proportion of them are predominantly Spanish-speakers?
5. Remember that two variables are **independent** if the conditional distribution for one variable remains unchanged with respect to the other variable. Looking at this contingency table, are the two variables (language spoken at home, and proximity to a major highway) independent variables?

**Section 3: In as much or as little detail as you desire: reflect on your personal experiences, and understand how your experiences fit in the data that’s given here.**

1. If you grew up in the US: What state did you grow up in? Citing the map provided, what proportion of residents in your state live close to a highway (the map gives a range of values)? Does the information provided reflect your personal experience growing up in this state?

(If you grew up outside the US, use Texas as your baseline and answer as best as you can)
2. Did this article (or the project) raise your interest or awareness of air quality issues?

**Note that you will not be graded on your responses to this section, provided that you do respond (and respond honestly). For example, if your answer to the final question is “no” (it didn’t raise your interest or awareness), please say so!**