Assignment 1: Data Lab

The objective of the assignments is threefold. One is to develop expertise in writing and communicating about technical topics. This will be done using the IEEE conference format for all assignments. The other is to explain, in your way, the mathematical ideas that are embedded within the technical topic of interest. For example, in this case, it is linear regression. The third is to use the topic, in this case of linear regression, to understand a problem from the real world. So in a sense, the objective is to write what one may call a mathematical essay on Linear Regression.

The title could be Assignment 1: a mathematical essay on linear regression.
Abstract. Give a brief overview of your assignment.
Author: Name, Department, Institution, Email

Section 1: Introduction
In this section, the 1st paragraph should be a broad overview of the topic. The 2nd paragraph should be an overview of the technical aspects (i.e. in this case it is linear regression). The 3rd paragraph should be about the problem that you are aiming to solve/understand using linear regression. Finally, the 4th paragraph should give an overview of the paper.

Section 2: Linear regression
This section should outline the fundamental principles underlying linear regression.

Section 3: The problem
 (a) Outline the problem and plot/visualise the data.
 (b) Make progress on the problem, by applying the techniques of linear regression to the problem at hand.
 (c) Discuss any insights and observations.

Imagine that we're data scientists/ engineers employed by a consulting company. Our consulting firm has been hired by a nonprofit organisation whose mission is to advocate for better health outcomes for low-income populations in the United States. We've been asked to examine whether low-income groups are at greater risk for being diagnosed and dying from cancer. If successful, our analysis will help the nonprofit with lobbying and fundraising.

Goals:
1. Demonstrate whether or not cancer incidence and mortality are correlated with socioeconomic status.
2. Provide quantitative and visual evidence that the nonprofit can take and use to further its mission.

Objectives:
1. Gather, Clean and prepare data
2. Exploratory analysis
3. Statistical model
4. Visualizations

Section 4. Conclusions

Write about 1 paragraph on the key insights obtained from your study and outline any further avenues of possible investigation.

References

Please put in all the references that you have used during the assignment. The format should be the same as the IEEE conference format.