Sta 108 - Project 2

The CDI Data (continued)

• *Backgroud.* The CDI data is described on pages 1349 and 1350 of the book.
• *Requirements:*
1. You are encouraged to work in small groups with 2-3 people in each group. Each group will submit one report, with the names of the group members on the front page.
2. The report should begin with a brief introduction (about one page), followed by the parts listed below. The introduction may include the half-page introduction of your previous project, plus something about the current project.
3. The due date of the project is Monday, March 9, 2020, before or after the lecture.

• *Data*: Available at the Smartsite, or on CD attached to the book.

• The project has three parts:

Part I: Multiple linear regression I. This part consists of Project 6.28 in the book, with the following additional part:
f. Now expand both models proposed above by adding all possible two-factor interactions. Note that, for a model with X_1, X_2, X_3 as the predictors, the two-factor interactions are X_1X_2, X_1X_3, X_2X_3. Repeat part **d** for the two expanded models.

Part II: Mutiple linear regression II. This part consists of Project 7.37 in the book, with the following changes.
1. Take out variable X_6, that is, you will not consider the total serious crimes (X_6) as a predictor in this project. Make the corresponding changes in parts **a**–**c**.
2. Add the following part:
d. Compute three additional coefficients of partial determination: $R^2_{Y,X_3,X_4|X_1,X_2}$, $R^2_{Y,X_3,X_5|X_1,X_2}$, and $R^2_{Y,X_4,X_5|X_1,X_2}$. Which pair of predictors is relatively more important than other pairs? Use the F test to find out whether adding the best pair to the model is helpful given that X_1, X_2 are already included.

Part III: Discussion. Discuss about your results from a practical standpoint. What particular parts of the course material do you find most relevant to your analysis in this project (try to be as specific as possible)? Any suggestions on how to improve the linear regression models?

Note: Please provide your computer codes, as well as screenshots (limit to one page for each Part) of how the codes are run, as an Appendix attachment to your project report.