HW 3

Exercise 3.1 (Reality TV and cosmetic surgery (Data set: BDYIMG))**.**

(a) Fit the first-order model, $E(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4$, to the data in the file. Give the least squares prediction equation

(b) Interpret the β estimates in the words of the problem. (Yes, you need to find the values of $\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3, \hat{\beta}_4$ and interpret them one by one.)

(c) Is the overall model statistically useful for predicting desire to have cosmetic surgery? Test using $\alpha = .01$. (When performing the hypothesis testing, do not forget to write down the hypotheses first!)

Exercise 3.2 (Arsenic in groundwater (Data set: ASWELLS))**.**

- (a) Write a first-order model for arsenic level (y) as a function of latitude, longitude, and depth.)
- (b) Fit the model to the data using the method of least squares.
- (c) Find the value of $\hat{\beta}_2$ and give a practical interpretation of $\hat{\beta}_2$.
- (d) Find the model standard deviation, s, and interpret its value.
- (f) Conduct a test of overall model utility at $\alpha = .05$. (When performing the hypothesis testing, do not forget to write down the hypotheses first!)