

# HW 3

**Exercise 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  $\beta$  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!)

**Solution:** sdffdasf

**Exercise 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!)