

ISyE 6739 – Group Activity 18

Names:

Group Number:

Problem 1. Data from a patient satisfaction survey in a hospital are given below.

Age	55	46	30	35	59	61	74	38	27
Anxiety	2.1	2.8	3.3	4.5	2.0	5.1	5.5	3.2	3.1
Satisfaction	68	77	96	80	43	44	26	88	75

- a. Fit a multiple linear regression model for regressing satisfaction on age and anxiety and their interactions

Use R to do matrix multiplication. To create matrix X you can use $X = t(rbind(rep(1,9) , c(55, 46, 30, ..., 27), c(2.1, 2.8, 3.3,...,3.1), c(55*2.1, 46*2.8, 30*3.3, ..., 27*3.1)))$. Also, $Y = c(68, 77, 96, ..., 75)$. $t()$ is the transpose function, $solve()$ is the inverse function, and $\%*\%$ is the matrix multiplication.

- b. Find 95% confidence intervals for the age coefficient and anxiety coefficient. Are age and severity important factors in predicting the satisfaction?
- c. Test the hypothesis on the significance of the coefficients using ANOVA method.
- d. Compute R^2 and R^2 -adjusted.
- e. Find a confidence interval for the mean response when $X = [1 \ 55 \ 2.1]$.
- f. Find a prediction interval for a new observation with $X = [1 \ 52 \ 4.0]$.