Stat 482 Homework Set #7

The goal is to study the relationship between patient satisfaction (y) and patient's age (x_1), severity of illness (x_2), and anxiety level (x_3). Refer to the data from Exercise 6.15.

1. Compute t statistics for testing the effect of each input variable.
Explain what type of effect is being tested here.

2. Compute the F statistic for testing the multiple regression model against a no effects model.
Explain what type of effect is being tested here.

3. Compute the sequential sum of squares $SSR(X_1)$, $SSR(X_2|X_1)$, $SSR(X_3|X_1, X_2)$.
Explain what each sum of squares represents, stated in the context of the problem.

4. Consider testing for the effect of anxiety level on patient satisfaction.
   (a) Test for an effect of X_3 against a model which only includes X_1.
(i.e., compute $F^*_{3|1}$ and its p-value)
   (b) Test for an effect of X_3 against a model which includes both X_1 and X_2.
(i.e., compute $F^*_{3|1,2}$ and its p-value)
   (c) Explain the different motivations for the above tests, stated in the context of the problem.