Stat 482 Homework Set #5

Refer to the data from Exercise 3.15

A designed experiment is conducted to study the concentration of a solution (y) over time (x) in hours.

1.

(a) Compute the estimated regression line.

(b) Compute a point estimate for μ_5, the mean concentration for $x = 5$ hours.

(c) Explain an advantage of using the regression estimate $\widehat{\mu}_5$ instead of the sample mean $\overline{y}_5$, and explain when this advantage will lead to a more accurate estimator.

2.

(a) State the full model (saturated model) in testing for regression model fit.

(b) Compute $SSPE$ and $SSLF$ for testing the fit of the linear regression model. State the respective degrees of freedom.

(c) Compute F^*_{LF} and the p-value. Provide an interpretation of your result.

(d) Create a plot comparing the fitted values from the regression model with the fitted values from the saturated model.