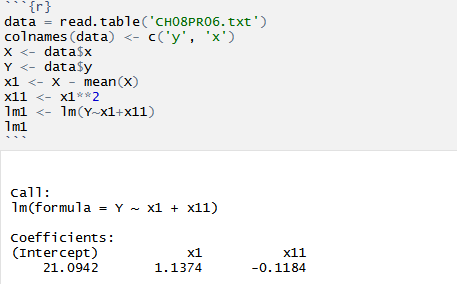
**Linear Regression Homework 7**

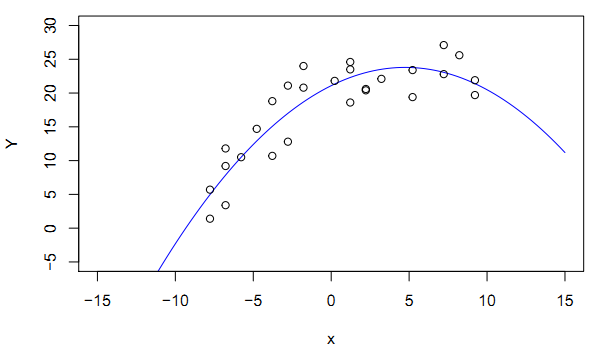
Name: Eric Yuan

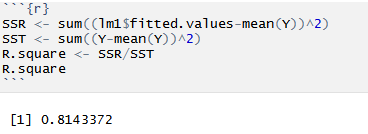
UNI: qy2205

**1. Chapter 8 problem 6**

**(a)**





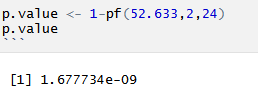


Based on the result, we could see quadratic function seems a good fit.

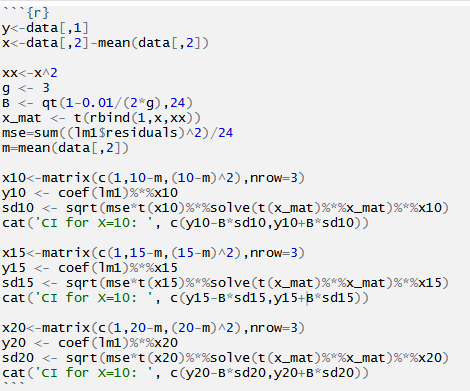
**(b)**

Since

So we reject which means there is a regression relation



**(c)**

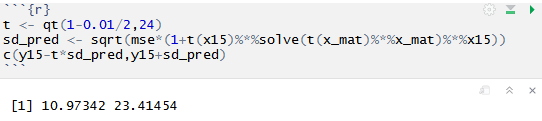


99% confidence interval for x=10: [7.559977,13.580437]

99% confidence interval for x=15: [17.22897,23.04688]

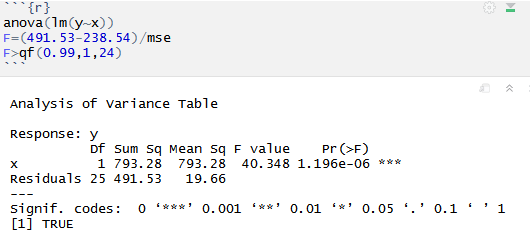
99% confidence interval for x=20: [20.99140,26.57975]

**(d)**



99% prediction interval for x=15 is [10.97342,23.41454]

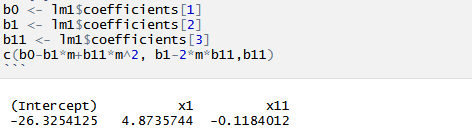
**(e)**



Since

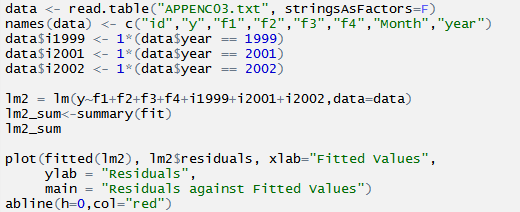
So we reject

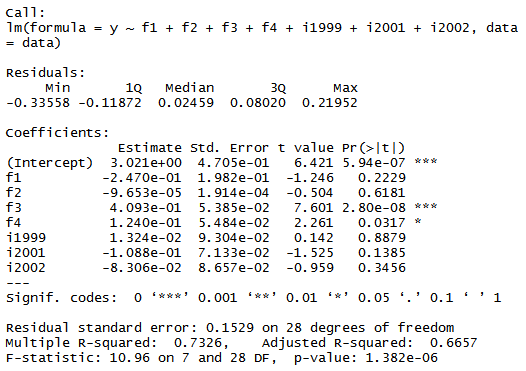
**(f)**

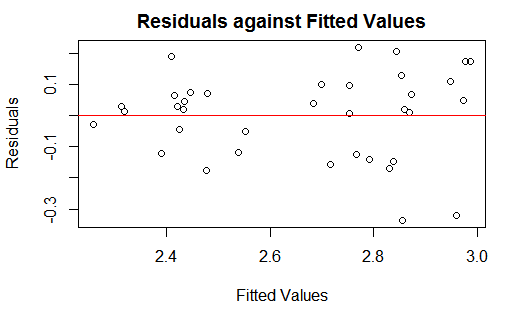


**2. Chapter 8 problem 42**

**(a)**



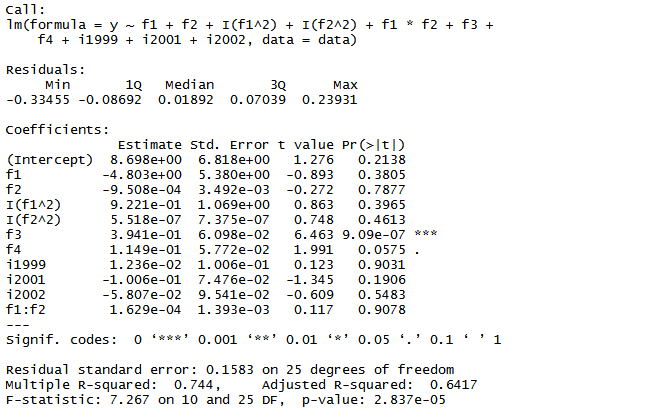




The first-order model is good since the residual seems follow the normal distribution.

**(b)**

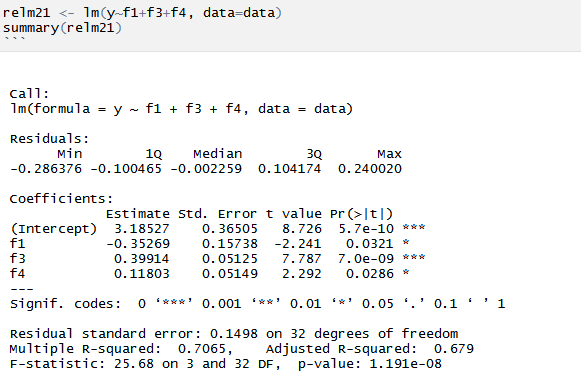
C:\Users\ADMINI~1\AppData\Local\Temp\WeChat Files\09b0c19950d2460949ac80d080738f0.png



Since

So we reject and conclude

**(c)**

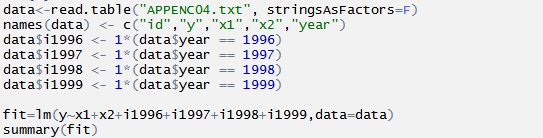


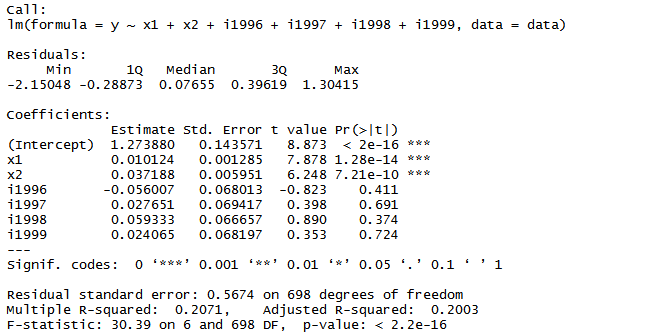
Since

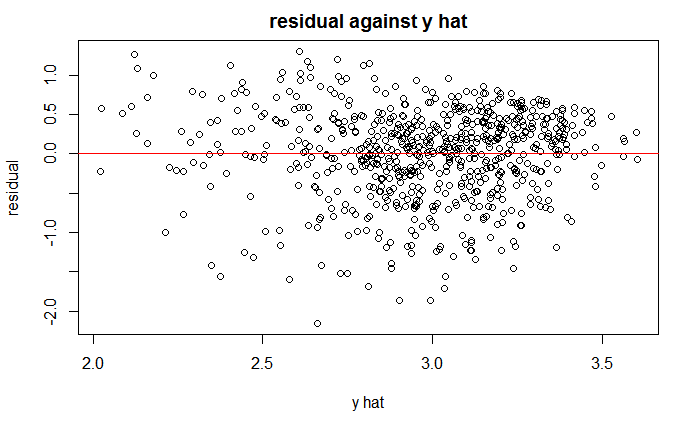
So we conclude

**3. Chapter 8 problem 43**

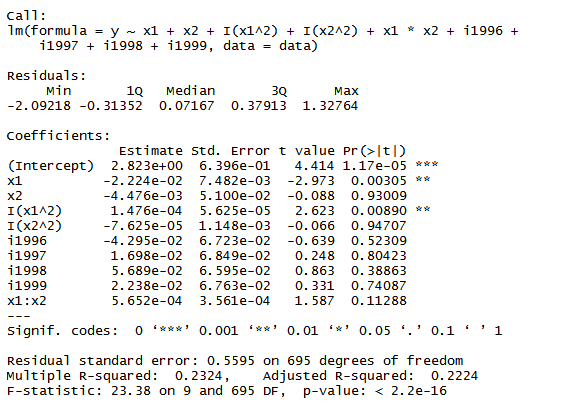
Fit the first order regression model first.

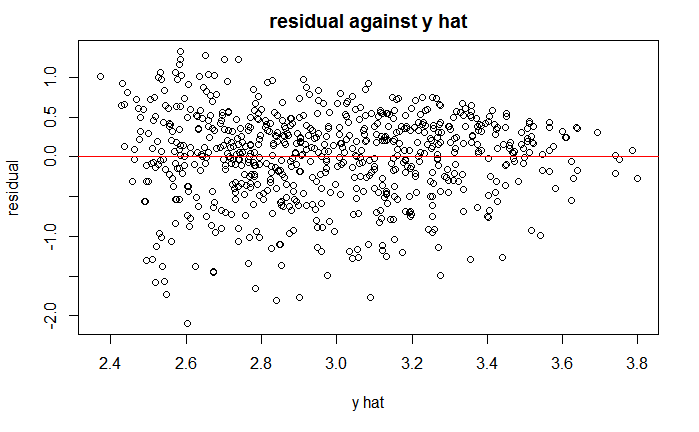






It seems the first order model is not good. Let’s try second order model.

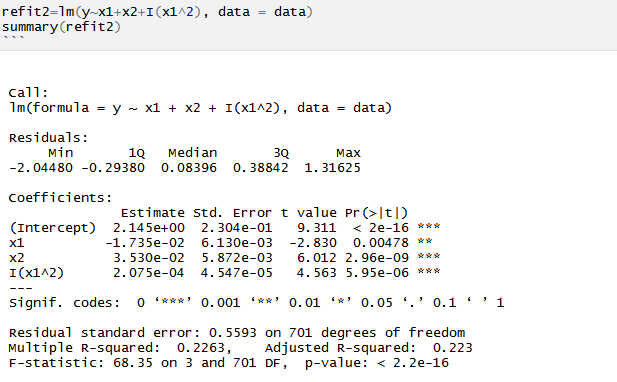




Based on the summary result, we can see that could be dropped from the model.

Since

So we conclude



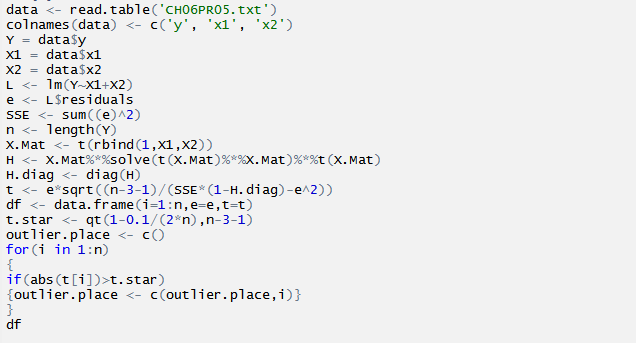
So the final model will be:

**4. Chapter 10, problem 9 abcdg**

**(a)**

Decision rule:

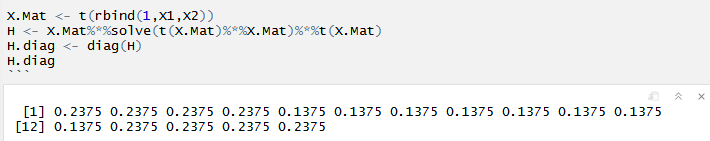
If , the data is an outlier





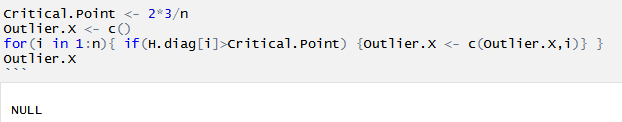
No outlying y observations.

**(b)**



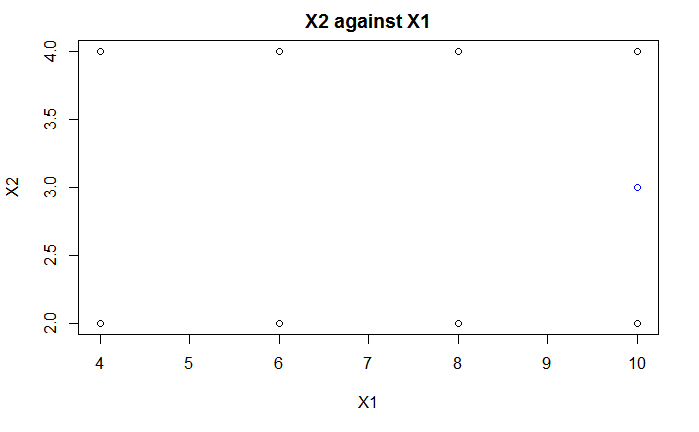
**(c)**

If which means ith data is an outlier. Write R code to test that.



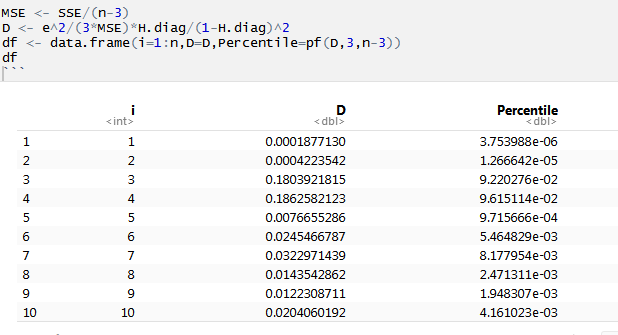
No outliers

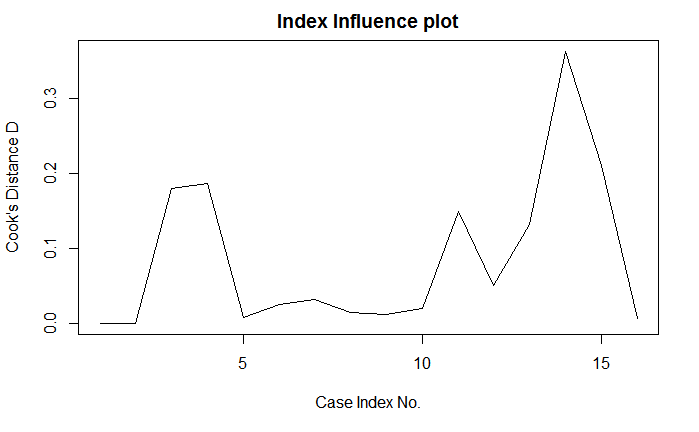
**(d)**

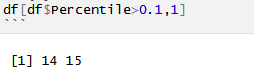


is not an outlier

**(g)**







Case 14 and 15 is inﬂuential.

**5.**

This is because