Homework 4

16.11.6

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Problem 1. Perform Linear Regression to simplerlr1.csv, and do inference to coefficents.

Result. The result is as follows:

$$\beta = (-0.9540925, 3.1561384)^\top$$

We use t-statistics to do inference.

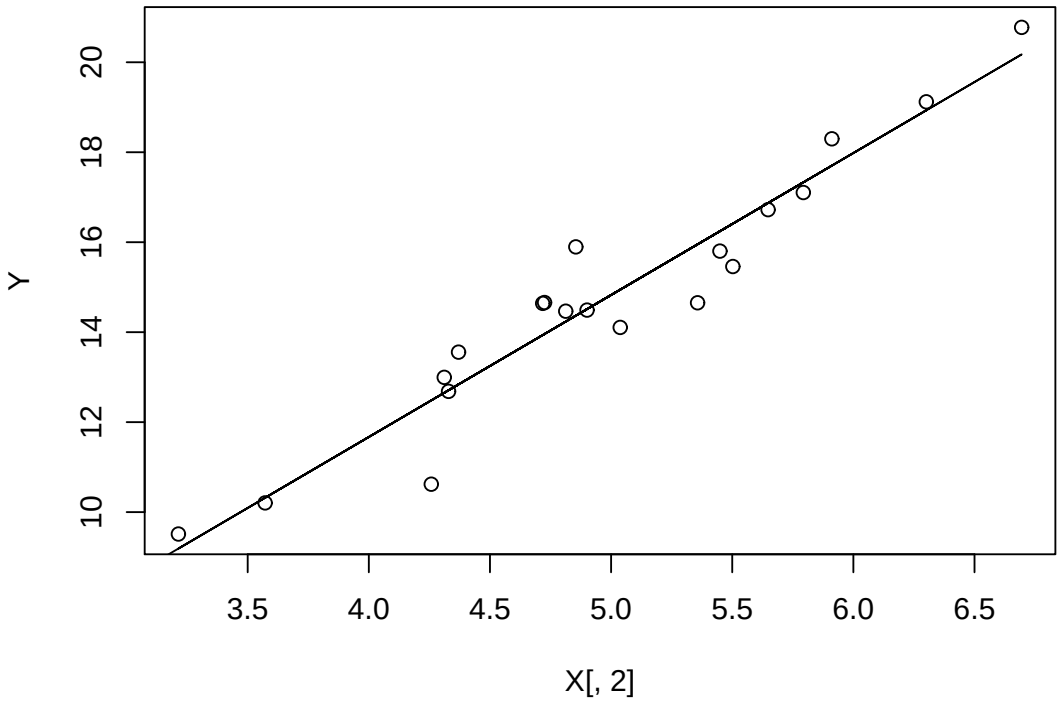

Figure 1: The clusters of Data1.csv with k = 3

The Null-hypothesis is $\beta_0 = 0$, and we choose $\alpha = 0.05$.

	0	10
β_0	True	False
β_1	False	False

However, when we use F-statistics, the result shows that we should reject H_0.

Problem 2. Perform Linear Regression to lr2.csv, and do inference to coefficents.

Result. The result is as follows:

$$\beta = (1.3050691, 1.8833781, 2.8539523, 0.6671587, -0.1968839)^\top$$

We use seperately t-statistics and F-statistics to do inference.

t-statistics:

	0	10	-10
β_0	True	True	False
β_1	True	False	False
β_2	True	False	False
β_3	True	False	False
β_4	True	False	False

Table 1: Result of t-statistics

F-statistics:

β_0	False	β_1	False
β_2	False	β_3	False
β_4	True		
β_0, β_1	False	β_0, β_2	False
β_0, β_3	False	β_0, β_4	False
β_1, β_2	False	β_1, β_3	False
β_1, β_4	False	β_2, β_3	False
β_2, β_4	False	β_3, β_4	True
$\beta_0, \beta_1, \beta_2$	False	$\beta_0, \beta_1, \beta_3$	False
$\beta_0, \beta_1, \beta_4$	False	$\beta_0, \beta_2, \beta_3$	False
$\beta_0, \beta_2, \beta_4$	False	$\beta_1, \beta_2, \beta_3$	False
$\beta_1, \beta_2, \beta_4$	False	$\beta_1, \beta_3, \beta_4$	False
$\beta_2, \beta_3, \beta_4$	False		
$\beta_0, \beta_1, \beta_2, \beta_3$	False	$\beta_0, \beta_1, \beta_2, \beta_4$	False
$\beta_0, \beta_1, \beta_3, \beta_4$	False	$\beta_0, \beta_2, \beta_3, \beta_4$	False
$\beta_1, \beta_2, \beta_3, \beta_4$	False	$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$	False

Table 2: Result of F-statistics