Homework 3

Neeraj Vardhan Buneeti

2024-09-20

#Question 3

Based on the code from Homework 2, Problem 5, completing the given tasks.

```
df <- read.csv("simulated_data.csv",header=TRUE,sep=',')

x1<-df$x
y<-df$y

model1<- lm(y ~ x1)
options(digits = 9)
summary(model1)
```

```
##
## Call:
## lm(formula = y ~ x1)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -4.924382 -1.213703  0.023493  1.135835  5.901517
##
## Coefficients:
##               Estimate Std. Error t value   Pr(>|t|)
## (Intercept) 2.0709159  0.1096824  18.881 < 2.22e-16 ***
## x1          6.9898955  0.0190976 366.009 < 2.22e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.7353 on 998 degrees of freedom
## Multiple R-squared:  0.992605,   Adjusted R-squared:  0.992598
## F-statistic:  133963 on 1 and 998 DF,  p-value: < 2.22e-16
```
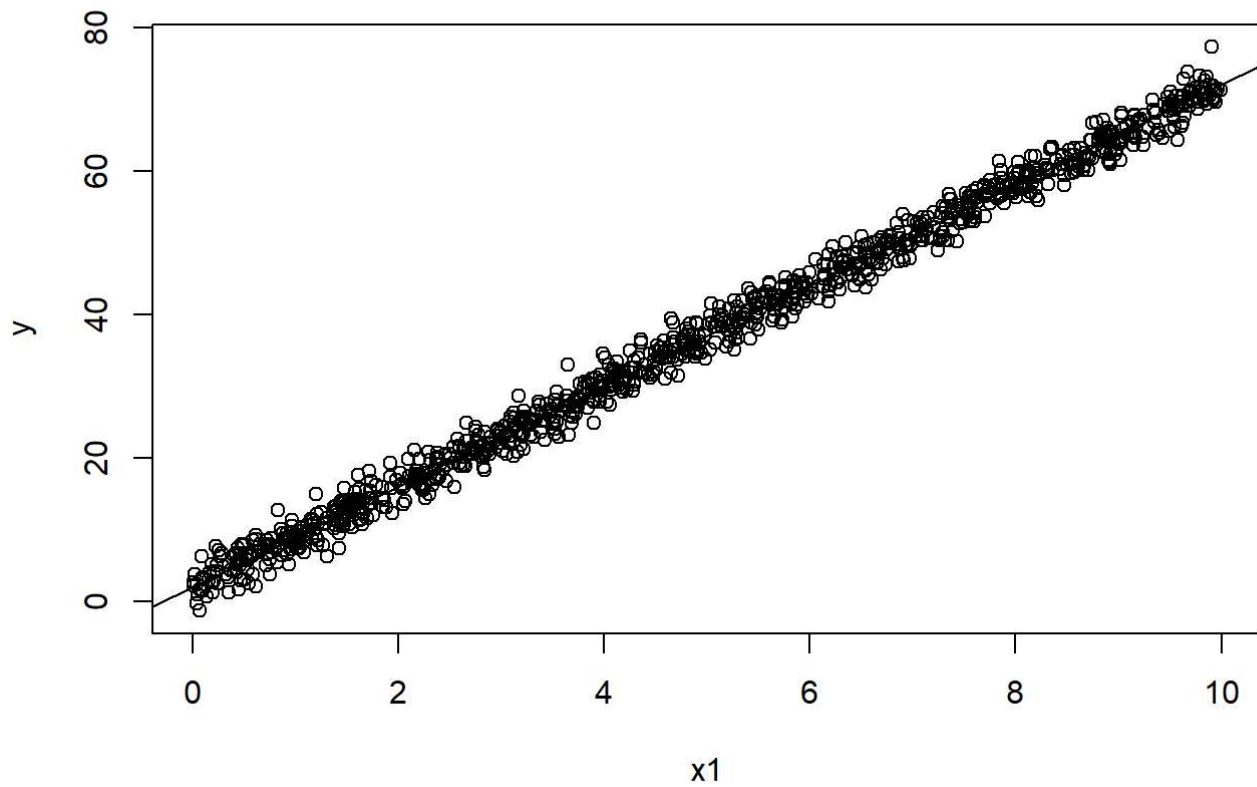
```
plot(x1,y)
abline(model1)
```

#Question 4

Based on thre code from Homework 2, Problem 5, completing the given tasks.

```
df <- read.csv("simulated_data_nonconstant_variance.csv",header=TRUE,sep=',')

x1<-df$x
y<-df$y

model1<- lm(y ~ x1)
options(digits = 9)
summary(model1)
```

```
##
## Call:
## lm(formula = y ~ x1)
##
## Residuals:
##       Min       1Q    Median       3Q       Max
## -245.0422  -11.2756   -1.3464   13.2031  335.2770
##
## Coefficients:
##              Estimate Std. Error  t value Pr(>|t|)
## (Intercept) 3.783044   2.769135  1.36615   0.1722
## x1          6.588801   0.482154 13.66533   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 43.8109 on 998 degrees of freedom
## Multiple R-squared:  0.157622,   Adjusted R-squared:  0.156778
## F-statistic: 186.741 on 1 and 998 DF,  p-value: < 2.22e-16
```

```
plot(x1,y)
abline(model1)
```