TruongWileyHW5

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The number of pounds of steam used per month at a plant is thought to be related to the average monthly ambient temperature. The past year ' s usages and temperatures follow

```
##
## Call:
## lm(formula = yi ~ xi)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.5629 -1.2581 -0.2550  0.8681  4.0581
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -6.33209    1.67005  -3.792  0.00353 **
## xi           9.20847    0.03382 272.255  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.946 on 10 degrees of freedom
## Multiple R-squared:  0.9999, Adjusted R-squared:  0.9999
## F-statistic: 7.412e+04 on 1 and 10 DF,  p-value: < 2.2e-16

## [1] 0.9998651

## [1] 0.9998651

## [1] 1.996466

## [1] 1.099192e-20

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## Analysis of Variance Table
##
## Response: yi
##           Df Sum Sq Mean Sq F value    Pr(>F)
## xi         1 280590  280590   74123 < 2.2e-16 ***
## Residuals 10     38       4
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```
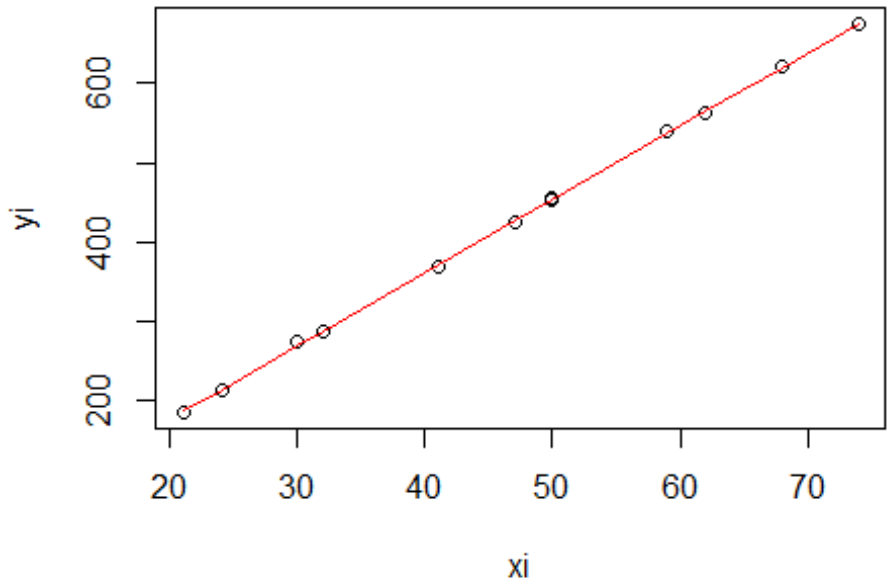

```
##                   2.5 %    97.5 %
## (Intercept) -10.053181 -2.610993
## xi            9.133106  9.283830
```

2.12a - Fit a simple linear regression model to the data.

```
plot(xi,yi)
lines(sort(xi),yH, col="red")
```



By looking at our regression line against the plot, we can see that it fits well.

2.12b - Test for significance of regression.

```
## [1] 3.78547
```

Our MSres is relatively a small number, interpretting this, we can conclude that our linear fit has low variability, therefore the fit is accurate.

2.12c - Plant management believes that an increase in average ambient temperature of 1 degree will increase average monthly steam consumption by 10,000 lb. Do the data support this statement?

```
## [1] 9.147165
```

```
## [1] 9.269771
```

The data does not support this statement with a 90% interval the increase does not include the expected 10,000.

2.12d - Construct a 99% prediction interval on steam usage in a month with average ambient temperature of 58 °

```
## [1] 526.5213

## [1] 528.9968
```

If the ambient temperature of the plant is 58 degrees we are 99% confident that the amount of steam usage would be between 526521 and 528997 pounts.