Probability R Assignment 4

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25/11/2019
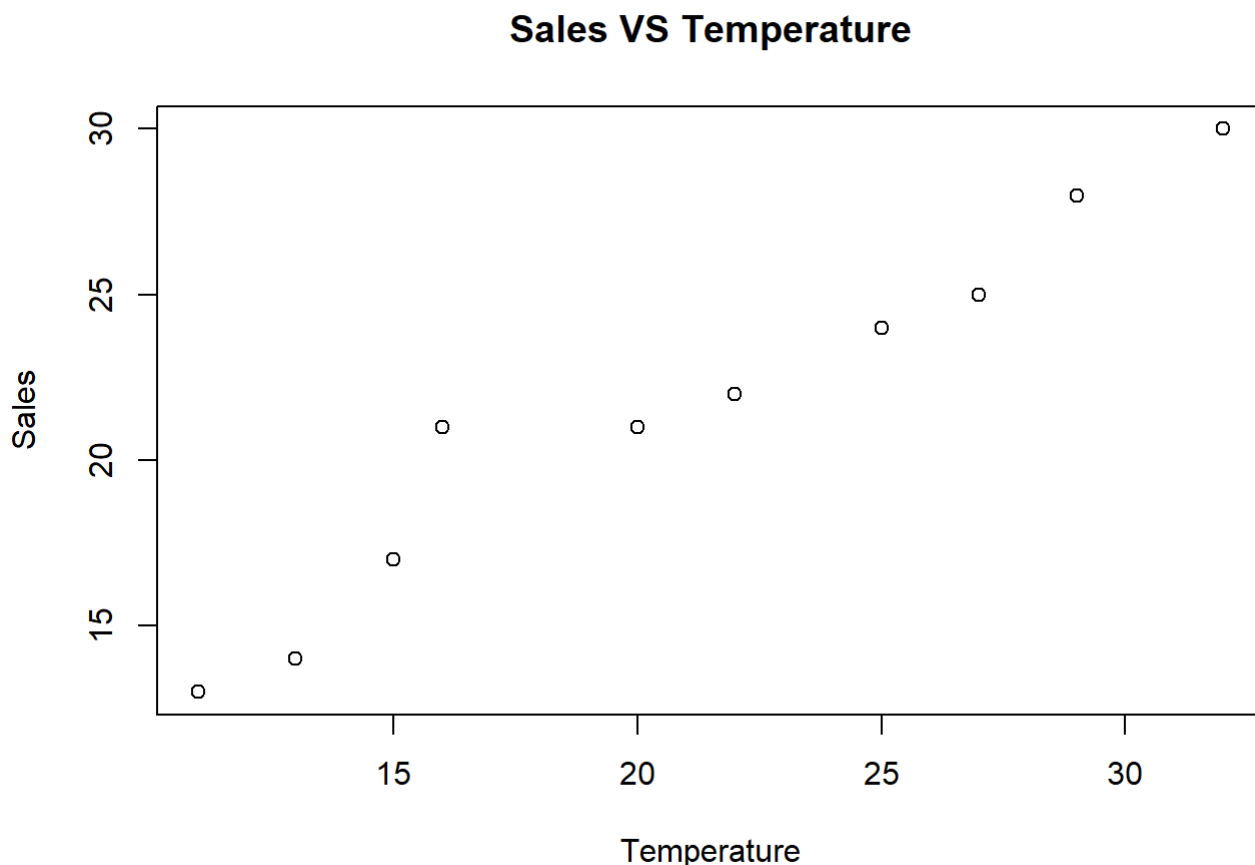
Importing Icecream Data

```
icecreamdata<-read.table("C:\\Users\\harshie\\Documents\\UCD\\Probability\\Lab4\\icecream.txt",he
ader=TRUE)
```

Part A:

Plotting the sales ~ temperature for the given data:

```
plot(icecreamdata$temperature,icecreamdata$sales, main = "Sales VS Temperature",xlab = "Temperatu
re",
     ylab = "Sales")
```


What sort of relationship exists between distance and damage?

The temperature and sales and linearly dependent in this model. So, as the temperature increases, the sales of increases also increases.

Part B

```
cor(icecreamdata$temperature,icecreamdata$sales)
```

```
## [1] 0.9722422
```

What is the value of the correlation coefficient?

The value of the correlation coefficient is 0.9722422.

Part 3

```
lsfit(icecreamdata$temperature,icecreamdata$sales)
```

```
## $coefficients
## Intercept         X
## 5.5689655 0.7586207
##
## $residuals
##  [1] -0.91379310 -1.43103448  0.05172414  3.29310345  0.25862069
##  [6] -0.25862069 -0.53448276 -1.05172414  0.43103448  0.15517241
##
## $intercept
## [1] TRUE
##
## $qr
## $qt
##  [1] -67.9889697  16.3411898   0.4318630   3.6286006   0.4155509
##  [6]  -0.1909739  -0.6007612  -1.2072860   0.1861892  -0.2235981
##
## $qr
##          Intercept            X
##  [1,] -3.1622777 -66.40783086
##  [2,]  0.3162278  21.54065923
##  [3,]  0.3162278   0.16700832
##  [4,]  0.3162278   0.12058448
##  [5,]  0.3162278  -0.06511085
##  [6,]  0.3162278  -0.15795852
##  [7,]  0.3162278  -0.29723003
##  [8,]  0.3162278  -0.39007770
##  [9,]  0.3162278  -0.48292537
## [10,]  0.3162278  -0.62219687
##
## $qraux
## [1] 1.316228 1.259856
##
## $rank
## [1] 2
##
## $pivot
## [1] 1 2
##
## $tol
## [1] 1e-07
##
## attr(,"class")
## [1] "qr"
```

The equation of the regression model is

Icecream_Sales = Beta0 + Beta1*Temperature;

Icecream_Sales = 5.5689655 + 0.7586207*Temperture;

we can predict the sales of icecream when the temperature is 42, by solving the equation with its value,

```
sales<-5.5689655 + 0.7586207*42
```

Part D

Plotting the regression line in 'red' can be done using the below code,

```
plot(icecreamdata$temperature,icecreamdata$sales,main="Sales VS Temperature",
     xlab = "Temperature",ylab = "Sales")
abline(lsfit(icecreamdata$temperature,icecreamdata$sales)$coefficients,
       col="blue")
```


Sales VS Temperature
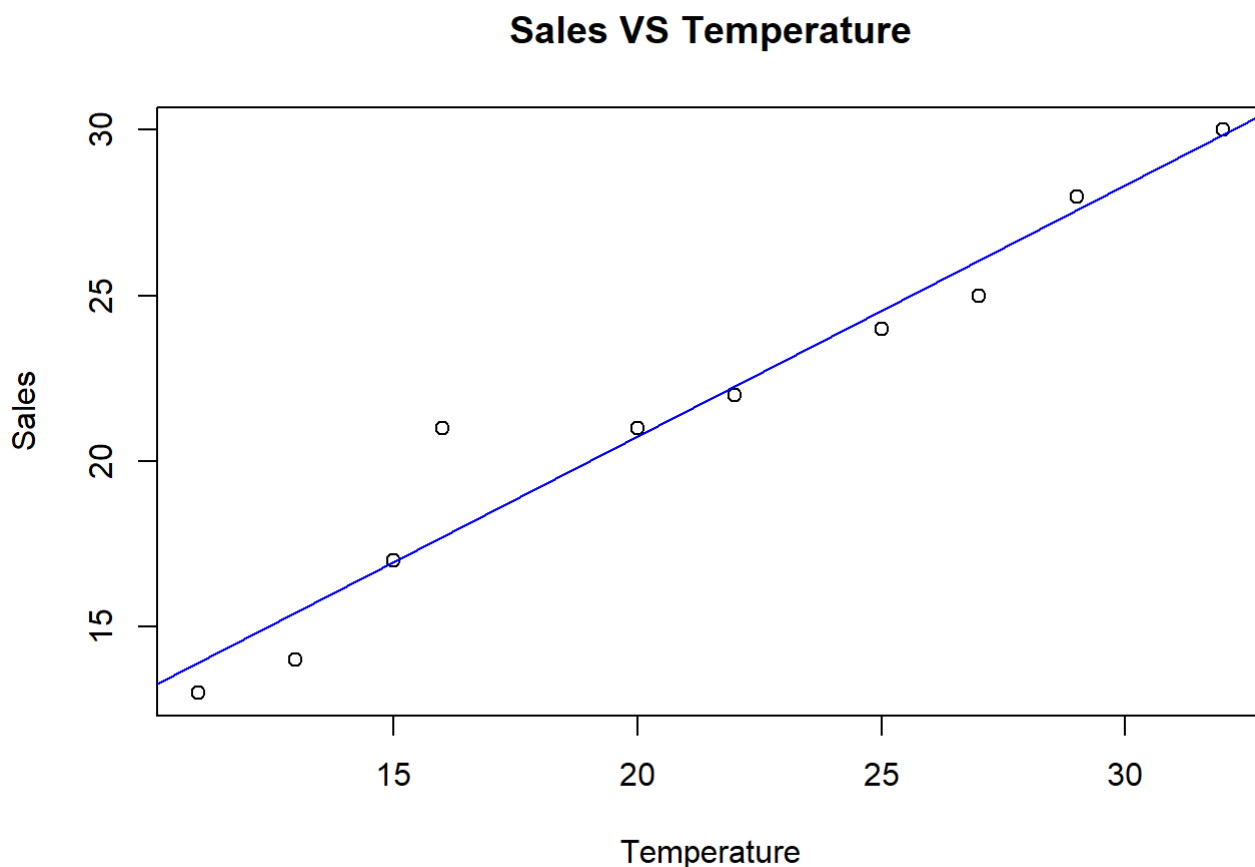
For changing the regression line color,

```
plot(icecreamdata$temperature,icecreamdata$sales,main="Sales VS Temperature",
     xlab = "Temperature",ylab = "Sales")
abline(lsfit(icecreamdata$temperature,icecreamdata$sales)$coefficients,
       col="red")
```

Sales VS Temperature