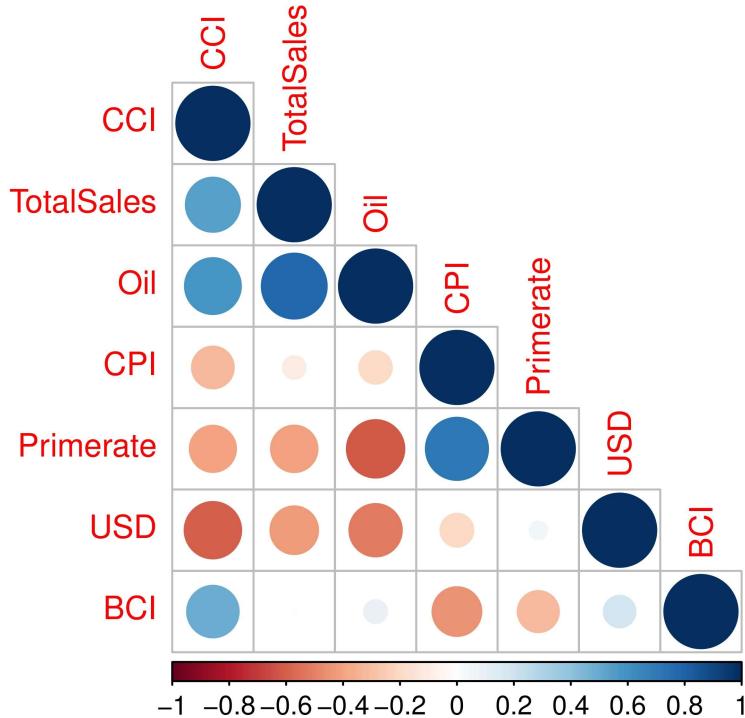


plotting correlation:

```
corrplot(corrModel, type = "lower", order = "hclust", title= "Correlation of Variables", mar = c(0,0,1,
```

Correlation of Variables



Building linear regression model with dependent variable- Total Sales and independent variables-

Prime rate and Oil

```

if(!require('broom'))
{
  install.packages('broom')
library(broom)
}

## Loading required package: broom

## Warning: package 'broom' was built under R version 4.1.1

lr_model <- lm(data = autodata_model, TotalSales~Oil+Primerate)

```

summary of lr_model:

```
summary(lr_model)
```

```

## 
## Call:
## lm(formula = TotalSales ~ Oil + Primerate, data = autodata_model)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -88798 -20363    955  17328  88641 
## 
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)    
## (Intercept) -252.2     21449.2 -0.012   0.9906    
## Oil          1703.8      120.7  14.121  <2e-16 ***  
## Primerate    3079.0     1451.7   2.121   0.0355 *   
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 31390 on 159 degrees of freedom
## Multiple R-squared:  0.6282, Adjusted R-squared:  0.6235 
## F-statistic: 134.3 on 2 and 159 DF,  p-value: < 2.2e-16

```

check output:

```

sumdata <- tidy(lr_model)
kable(sumdata)

```

term	estimate	std.error	statistic	p.value
(Intercept)	-252.2091	21449.200	-0.0117584	0.9906331
Oil	1703.8081	120.660	14.1207388	0.0000000
Primerate	3079.0156	1451.654	2.1210395	0.0354692

```

if(!require('jtools'))
{
  install.packages("jtools")
  library(jtools)
}

```

```

## Loading required package: jtools

```

```

if(!require('devtools'))
{
  install.packages('devtools')
  devtools::install_github("jacob-long/jtools")
  library(devtools)
}

```

```

## Loading required package: devtools

```

```

## Warning: package 'devtools' was built under R version 4.1.1

```

```

## Loading required package: usethis

```

```

lr_model <- lm(data = autodata_model, TotalSales~Oil+Primerate)

## summary(lr_model)

if(!require('devtools'))
{
  install.packages('devtools')
  library(devtools)
}

if(!require('jtools'))
{
  install.packages('jtools')
  library(jtools)
}

summ(lr_model)

```

Observations	162
Dependent variable	TotalSales
Type	OLS linear regression

F(2,159)	134.30
R ²	0.63
Adj. R ²	0.62

	Est.	S.E.	t val.	p
(Intercept)	-252.21	21449.20	-0.01	0.99
Oil	1703.81	120.66	14.12	0.00
Primerate	3079.02	1451.65	2.12	0.04

Standard errors: OLS

- In the summary of the regression model we see that both independent variables are significantly contributing to the model.
- Prime rate has a p-value of 0.04 and Oil has a p-value of 0.001.

Other Statistics:-

- The Squared R-value has a value of 0.63 which demonstrates a moderate correlation.
- The Adjusted Squared R-value has a value of 0.62 which is inline with the squared R value.
- Residual Standardized error- 31390 on 159 degrees of freedom shows that there is quite some deviation when applying the linear regression formula calculate.

plot results of the original value Vs fitted values:-

```

coeff = coefficients(lr_model)

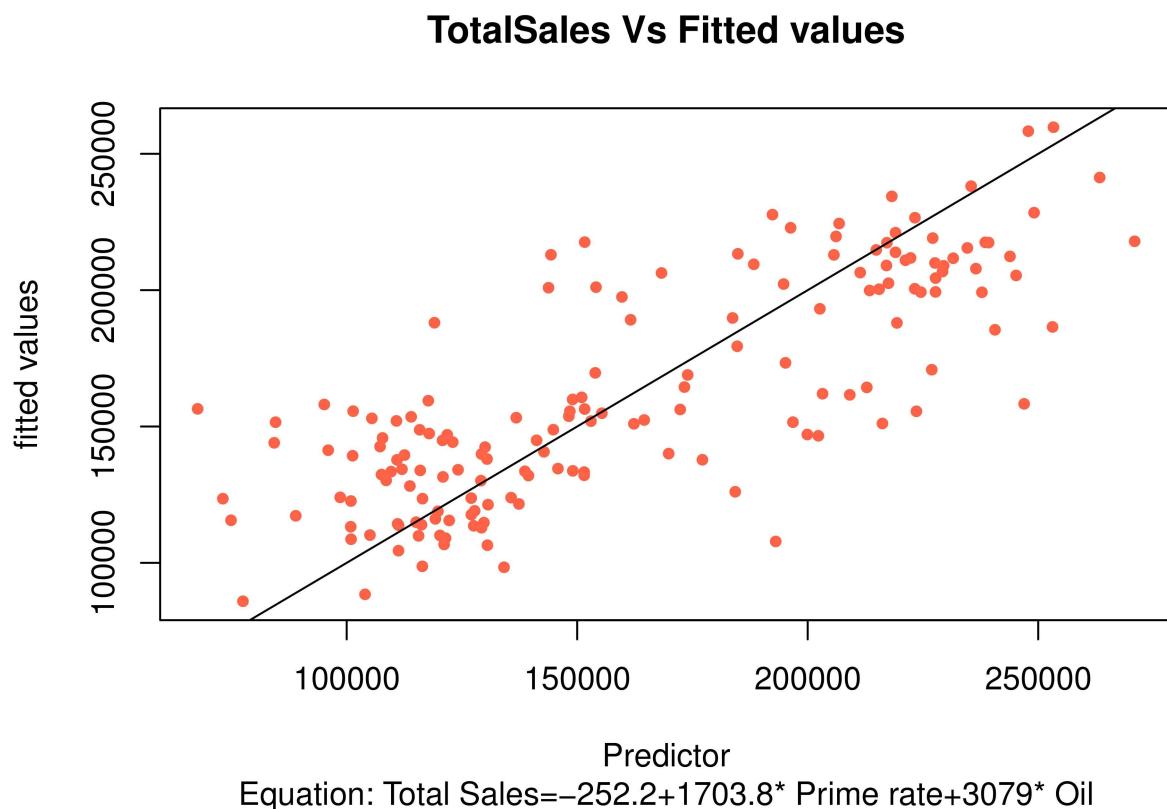
### equation for figure:-

eq = paste0("Equation: Total Sales=", round(coeff[1],1), "+", round(coeff[2],1),"* Prime rate", "+", round(coeff[3],1),"* Oil", "+", round(coeff[4],1))

auto_data$TotalSales.lr_model <- lr_model$fitted.values

plot(auto_data$TotalSales, fitted.values(lr_model), xlab = "Predictor", ylab = "fitted values", pch=20, abline(a=0,b=1)

```



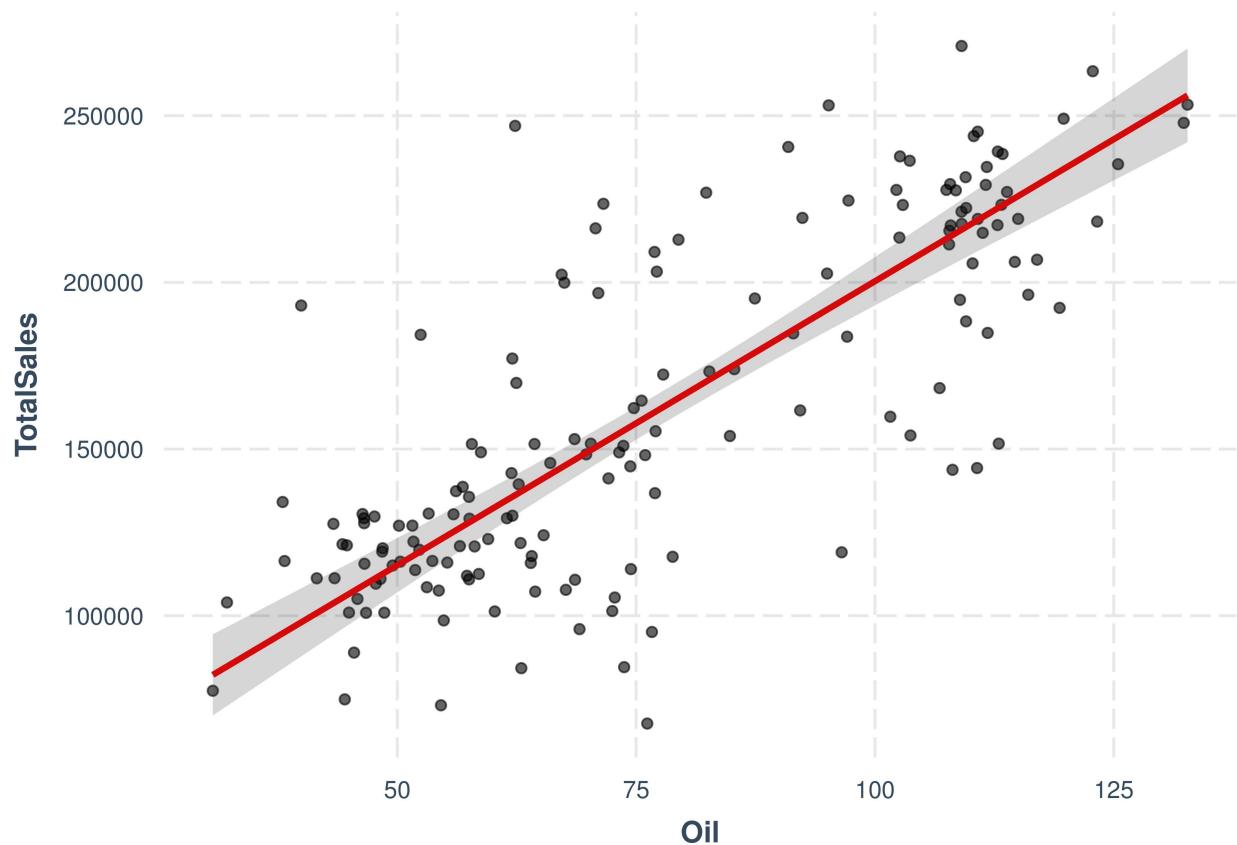
- It can be observed when adding a diagonal line that the values are quite spreading around this line. This is in accordance with the statistics observed a moderate squared R-value and residual standard error.

creating effect plot for each of Prime rate and oil separated.

```

par(mfrow=c(2,2))
effect_plot(lr_model, pred = Oil, interval = TRUE, plot.points = TRUE, colors = "red")

```



```
effect_plot(lr_model, pred = Primerate, interval = TRUE, plot.points = TRUE, colors = "red")
```