Linear Regression Model in RStudio

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Aim-To Create Linear Model in R

Code-

```
weight=c(15,26,27,2,25.5,27,32,18,22,20,26,24)
weight
bmi=c(133.35,16.1,16.74,16,13.59,15.73,15.65,13.85,16.07,12.8,13.65,14.42)
bmi
model=lm(bmi~weight)
model
coeffs=coefficients(model)
coeffs
summary.lm(model)
summary(model)
#y=mx+c
bmi= coeffs[1] + coeffs[2]*weight
bmi
Y=c(110,80,70,120,150,90,70,120)
Y
X1=c(30,40,20,50,60,40,20,60)
X1
X2=c(11,10,7,15,19,12,8,14)
X2
inputdata=data.frame(Y,X1,X2)
inputdata
RegModel<-lm(Y~X1+X2,data = inputdata)
RegModel
summary(RegModel)
Price=c(4.5,5.5,4.5,4.5,4.0,5.5,5.5,6.5,5.0,5.5,6.0,4.5)
Price
QuantitySold=c(125,115,140,140,150,150,130,120,130,100,105,150)
QuantitySold
```

```
model=lm(Price~QuantitySold)
model
coeffs=coefficients(model)
coeffs
summary.lm(model)
summary(model)
Height=c(175,168,170,171,169,165,165,160,180,186)
Height
Weight=c(80,68,72,75,70,65,62,60,85,90)
Weight
model=lm(Height~Weight)
model
coeffs=coefficients(model)
coeffs
summary.lm(model)
summary(model)
```

Output-

```
> weight=c(15,26,27,2,25.5,27,32,18,22,20,26,24)
> weight
 [1] 15.0 26.0 27.0  2.0 25.5 27.0 32.0 18.0 22.0
20.0 26.0 24.0
>
bmi=c(133.35,16.1,16.74,16,13.59,15.73,15.65,13.85,1
6.07,12.8,13.65,14.42)
> bmi
 [1] 133.35  16.10  16.74  16.00  13.59  15.73
15.65  13.85  16.07  12.80  13.65  14.42
> model=lm(bmi~weight)
> model

Call:
lm(formula = bmi ~ weight)

Coefficients:
(Intercept)       weight
     52.334       -1.248

> coeffs=coefficients(model)
> coeffs
```

```
(Intercept)      weight
  52.334114   -1.247861
> summary.lm(model)

Call:
lm(formula = bmi ~ weight)

Residuals:
    Min      1Q  Median      3Q     Max
-33.838 -10.253  -6.582  -2.659  99.734

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   52.334     30.978   1.689    0.122
weight        -1.248      1.331  -0.937    0.371

Residual standard error: 34.39 on 10 degrees of
freedom
Multiple R-squared:  0.08076,  Adjusted R-squared:
-0.01116
F-statistic: 0.8786 on 1 and 10 DF,  p-value: 0.3707

> summary(model)

Call:
lm(formula = bmi ~ weight)

Residuals:
    Min      1Q  Median      3Q     Max
-33.838 -10.253  -6.582  -2.659  99.734

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Multiple R-squared:  0.08076,  Adjusted R-squared:
-0.01116
```

```
F-statistic: 0.8786 on 1 and 10 DF,  p-value: 0.3707

> #y=mx+c
> bmi= coeffs[1] + coeffs[2]*weight
> bmi
 [1] 33.61619 19.88971 18.64185 49.83839 20.51365
18.64185 12.40255 29.87261 24.88116 27.37688
19.88971 22.38544
> Y=c(110,80,70,120,150,90,70,120)
> Y
[1] 110  80  70 120 150  90  70 120
> X1=c(30,40,20,50,60,40,20,60)
> X1
[1] 30 40 20 50 60 40 20 60
> X2=c(11,10,7,15,19,12,8,14)
> X2
[1] 11 10  7 15 19 12  8 14
> inputdata=data.frame(Y,X1,X2)
> inputdata
    Y X1 X2
1 110 30 11
2  80 40 10
3  70 20  7
4 120 50 15
5 150 60 19
6  90 40 12
7  70 20  8
8 120 60 14
> RegModel<-lm(Y~X1+X2,data = inputdata)
> RegModel

Call:
lm(formula = Y ~ X1 + X2, data = inputdata)

Coefficients:
(Intercept)           X1           X2
    16.8314      -0.2442       7.8488

> summary(RegModel)
```

```
Call:
lm(formula = Y ~ X1 + X2, data = inputdata)

Residuals:
      1       2       3       4       5       6
7       8
 14.157  -5.552   3.110  -2.355  -1.308 -11.250
-4.738   7.936

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  16.8314    11.8290   1.423   0.2140
X1           -0.2442     0.5375  -0.454   0.6687
X2            7.8488     2.1945   3.577   0.0159 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’
0.1 ‘ ’ 1

Residual standard error: 9.593 on 5 degrees of
freedom
Multiple R-squared:  0.9191,   Adjusted R-squared:
0.8867
F-statistic:  28.4 on 2 and 5 DF,  p-value: 0.001862

>
Price=c(4.5,5.5,4.5,4.5,4.0,5.5,5.5,6.5,5.0,5.5,6.0,
4.5)
> Price
 [1] 4.5 5.5 4.5 4.5 4.0 5.5 5.5 6.5 5.0 5.5 6.0 4.5
>
QuantitySold=c(125,115,140,140,150,150,130,120,130,1
00,105,150)
> QuantitySold
 [1] 125 115 140 140 150 150 130 120 130 100 105 150
> model=lm(Price~QuantitySold)
> model

Call:
lm(formula = Price ~ QuantitySold)
```

```
Coefficients:
 (Intercept)  QuantitySold
     8.66359      -0.02731

> coeffs=coefficients(model)
> coeffs
 (Intercept) QuantitySold
  8.66359007  -0.02730745
> summary.lm(model)

Call:
lm(formula = Price ~ QuantitySold)

Residuals:
     Min       1Q   Median       3Q      Max
-0.75016 -0.36362 -0.09055  0.24936  1.11330

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   8.66359    1.37420   6.304 8.86e-05
***
QuantitySold -0.02731    0.01052  -2.596   0.0267 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’
0.1 ‘ ’ 1

Residual standard error: 0.6018 on 10 degrees of
freedom
Multiple R-squared:  0.4026,   Adjusted R-squared:
0.3428
F-statistic: 6.738 on 1 and 10 DF,  p-value: 0.02668

> summary(model)

Call:
lm(formula = Price ~ QuantitySold)

Residuals:
     Min       1Q   Median       3Q      Max
-0.75016 -0.36362 -0.09055  0.24936  1.11330
```

```
Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   8.66359    1.37420   6.304 8.86e-05
***
QuantitySold -0.02731    0.01052  -2.596   0.0267 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’
0.1 ‘ ’ 1

Residual standard error: 0.6018 on 10 degrees of
freedom
Multiple R-squared:  0.4026,    Adjusted R-squared:
0.3428
F-statistic: 6.738 on 1 and 10 DF,  p-value: 0.02668

> Height=c(175,168,170,171,169,165,165,160,180,186)
> Height
 [1] 175 168 170 171 169 165 165 160 180 186
> Weight=c(80,68,72,75,70,65,62,60,85,90)
> Weight
 [1] 80 68 72 75 70 65 62 60 85 90
> model=lm(Height~Weight)
> model

Call:
lm(formula = Height ~ Weight)

Coefficients:
(Intercept)       Weight
   115.2002       0.7662

> coeffs=coefficients(model)
> coeffs
(Intercept)      Weight
115.2002059   0.7661595
> summary.lm(model)

Call:
lm(formula = Height ~ Weight)
```

```
Residuals:
    Min      1Q  Median      3Q     Max
-1.6622 -0.9683 -0.1622  0.5679  2.2979

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 115.20021    3.48450   33.06 7.64e-10
***
Weight        0.76616    0.04754   16.12 2.21e-07
***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’
0.1 ‘ ’ 1

Residual standard error: 1.405 on 8 degrees of
freedom
Multiple R-squared:  0.9701,    Adjusted R-squared:
0.9664
F-statistic: 259.7 on 1 and 8 DF,  p-value:
2.206e-07

> summary(model)

Call:
lm(formula = Height ~ Weight)

Residuals:
    Min      1Q  Median      3Q     Max
-1.6622 -0.9683 -0.1622  0.5679  2.2979

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 115.20021    3.48450   33.06 7.64e-10
***
Weight        0.76616    0.04754   16.12 2.21e-07
***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’
0.1 ‘ ’ 1
```

```
Residual standard error: 1.405 on 8 degrees of
freedom
Multiple R-squared:  0.9701,    Adjusted R-squared:
0.9664
F-statistic: 259.7 on 1 and 8 DF,  p-value:
2.206e-07
```