ESE\_56

Jeevan ~ 1740256

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library(readxl)

## Warning: package 'readxl' was built under R version 3.5.2

library(GGally)

## Warning: package 'GGally' was built under R version 3.5.3

## Loading required package: ggplot2

## Warning: package 'ggplot2' was built under R version 3.5.2

ESE\_data <- read\_excel("C:/Users/Jeevan/Desktop/Christ University/Statistics/Linear Regression/ESE\_data.xlsx")  
# View(ESE\_data)  
attach(ESE\_data)  
fit = lm(y~.,data = ESE\_data)  
step(fit,direction = "backward")

## Start: AIC=18.33  
## y ~ x2 + x3 + x4 + x5 + x6 + x7 + x8 + x9 + x10  
##   
##   
## Step: AIC=18.33  
## y ~ x2 + x3 + x4 + x5 + x6 + x7 + x8 + x9  
##   
##   
## Step: AIC=18.33  
## y ~ x2 + x3 + x4 + x5 + x6 + x8 + x9  
##   
## Df Sum of Sq RSS AIC  
## - x6 1 0.2015 34.618 16.516  
## - x3 1 0.5004 34.917 16.791  
## <none> 34.417 18.330  
## - x9 1 2.4917 36.908 18.566  
## - x4 1 2.7006 37.117 18.747  
## - x2 1 4.4836 38.900 20.248  
## - x8 1 4.9992 39.416 20.670  
## - x5 1 6.6016 41.018 21.945  
##   
## Step: AIC=16.52  
## y ~ x2 + x3 + x4 + x5 + x8 + x9  
##   
## Df Sum of Sq RSS AIC  
## - x3 1 0.4087 35.027 14.892  
## <none> 34.618 16.516  
## - x9 1 2.5250 37.143 16.769  
## - x2 1 5.8289 40.447 19.496  
## - x4 1 6.4706 41.089 20.000  
## - x8 1 6.8089 41.427 20.262  
## - x5 1 8.4697 43.088 21.520  
##   
## Step: AIC=14.89  
## y ~ x2 + x4 + x5 + x8 + x9  
##   
## Df Sum of Sq RSS AIC  
## <none> 35.027 14.892  
## - x9 1 4.1030 39.130 16.437  
## - x8 1 6.7293 41.756 18.515  
## - x4 1 6.7524 41.779 18.533  
## - x2 1 7.1559 42.183 18.841  
## - x5 1 9.0351 44.062 20.235

##   
## Call:  
## lm(formula = y ~ x2 + x4 + x5 + x8 + x9, data = ESE\_data)  
##   
## Coefficients:  
## (Intercept) x2 x4 x5 x8   
## -2.2538 5.4205 -3.5469 7.1611 -12.4590   
## x9   
## -0.2566

summary(fit)

##   
## Call:  
## lm(formula = y ~ ., data = ESE\_data)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -2.3594 -0.9179 0.1362 0.6940 2.2845   
##   
## Coefficients: (2 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -5.243486 14.099636 -0.372 0.7132   
## x2 6.146082 3.475846 1.768 0.0897 .  
## x3 0.004546 0.007696 0.591 0.5602   
## x4 -2.957382 2.155036 -1.372 0.1827   
## x5 6.579426 3.066486 2.146 0.0422 \*  
## x6 -0.663794 1.771016 -0.375 0.7111   
## x7 NA NA NA NA   
## x8 -14.488077 7.759581 -1.867 0.0741 .  
## x9 -0.260609 0.197705 -1.318 0.1999   
## x10 NA NA NA NA   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 1.198 on 24 degrees of freedom  
## Multiple R-squared: 0.6459, Adjusted R-squared: 0.5426   
## F-statistic: 6.254 on 7 and 24 DF, p-value: 0.0003045

plot(fit)

